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Atomism, Monism, and Causation in the Natural Philosophy of Margaret Cavendish

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1. INTRODUCTION

In 1653 Margaret Cavendish published her first book, a book of poems (*Poems, and Fancies*), the first fifty pages of which are devoted to expounding an atomic theory of nature.

> Small *Atomes* of themselves a *World* may make,
> As being subtle, and of every shape:
> And as they dance about, fit places finde,
> Such *Formes* as best agree, make every kinde. ...
> Severall *Figur'd Atomes* well agreeing,
> When joyn'd, do give another *Figure* being.
> For as those *Figures* joyned, severall waies,
> The *Fabrick* of each severall *Creature* raise.[1]

Two years later, among the prefatory materials to the first edition of her more traditionally written *Philosophical and Physical Opinions* (hereafter *Opinions*) she includes a 'Condemning Treatise of Atomes' in which she abandons this earlier position. 'I have considered that if onely matter were atoms, and that every atome is of the same degree, and the same quantity, as well as of the same matter; then every atom must

[1] Margaret Cavendish, *Poems, and Fancies* [*PF*] (London, 1653; facs. repr. Menston: Scolar Press, 1972), 5, 9. Other abbreviations of frequently cited primary texts from Cavendish are as follows. *GNP*: *Grounds of Natural Philosophy* (London, 1668; facs. repr. West Cornwall, Conn.: Locust Hill Press, 1996); *NBW*: *New Blazing World*, 2nd edn. (1668), in Susan James (ed.), *Political Writings* (Cambridge: Cambridge University Press, 2003), 1–109; *ODS*: *Orations of a Divers Sort*, 2nd edn. (1668), in James (ed.), *Political Writings*, 111–292; *OEP*: *Observations upon Experimental Philosophy*, ed. Eileen O'Neill, 2nd edn. [based on the 1668 edn.] (Cambridge: Cambridge University Press, 2001); *PL*: *Philosophical Letters; or, Modest Reflections upon some Opinions in Natural Philosophy* (London, 1664); *PPO*: *Philosophical and Physical Opinions*, 2nd edn. (London, 1663).

be of a living substance ... for else they could not move, but would be an infinite dull and immoving body.' Furthermore, if atomism were the true account of the nature of matter, then 'there would be an infinite and eternal disorder' (I consider reasons for this latter belief in Sections 4 and 5).[2] From 1655 onwards, Cavendish's theory of matter would remain a theory of material plenism, the view that the world is everywhere and only matter which is extended infinitely and which can be internally divided without end. Cavendish rejects the existence of anything immaterial in the natural world (including souls); she believes that matter is ubiquitously sensing, rational, and self-moving (though there are many forms—both human and non-human—of sense and reason given the variety of nature's kinds; *GNP* 18); and she claims that nature's parts are completely interrelated into a single whole. For these reasons, her mature matter theory has, reasonably, been called 'organicist materialism',[3] and one essential feature of it is the fact that human and non-human nature are essentially the same sort of thing because composed of matter. Her rejection of atomism in favour of this latter account of material nature would be repeated with regularity throughout her mature work.

Despite Cavendish's own protestations against an atomic theory of matter, some commentators believe that she did not—or, more significantly for her philosophy, could not—drop atomism as the true account of the material world. Stephen Clucas, for example, believes that what Cavendish rejected was merely 'the simple mechanism of "classical mechanism" ', according to which inert bits of matter interact by way of a few simple laws. She does not thereby reject all forms of atomism. Jay Stevenson thinks that she must be disingenuous in her rejections of atomism because one of her own arguments against atomism (Sections 3 to 5) rests upon the premiss of natural harmony,

[2] Margaret Cavendish, 'A Condemning Treatise of Atomes' *Philosophical and Physical Opinions*, ['Condemning Treatise'], in 1st edn. (London, 1655), A3^{r}. This treatise was excised from the second edition of the *Opinions*, from which I usually quote in this chapter (see n. 1).

[3] Eileen O'Neill, 'Cavendish, Margaret Lucus', in *The Routledge Encyclopedia of Philosophy* (New York: Routledge, 1998), 260–4, at 260; and Eileen O'Neill, Introduction ['Introduction'], in *OEP*, pp. x–xxxvi, at p. xvi. For an account of why Cavendish believes all matter must have perceptive states, see my 'Reason and Freedom: Margaret Cavendish on the Order and Disorder of Nature' ['Reason and Freedom'], *Archiv für Geschichte der Philosophie* (forthcoming).

and yet Cavendish elsewhere repeatedly acknowledges examples of disharmony obtaining in the natural world (specifically in human psychology)—disharmony that one might argue is best explained by atomism.[4]

I think Cavendish's anti-atomistic account of the natural world can be vindicated against both Clucas's and Stevenson's positions. Cavendish has two main arguments against atomism which I call the 'logico-mathematical' argument and the 'normative' argument. While the former, grounded in the unending divisibility of matter, is the stronger of the two for establishing material plenism, the latter is clearly Cavendish's signature argument, and it is the most interesting for us given what it tells us about her overall philosophy of nature. According to the normative argument against atomism, atoms, as freely acting beings, would produce disorder in nature, and yet we experience nature as orderly, and this seems to preclude atomism as the correct theory of matter.

I deal first (Section 2) with the logico-mathematical argument in order to refute Clucas's claim that Cavendish actually does retain atomism beyond her early years. The logico-mathematical argument is all she needs to establish material plenism and to reject atomism as a theory of matter. I deal then (Sections 3 to 5) with the normative

[4] Stephen Clucas, 'The Atomism of the Cavendish Circle: A Reappraisal' ['Reappraisal'], *The Seventeenth Century*, 9/2 (1994), 260. Clucas seems slightly more swayed by Cavendish's anti-atomism in her *Observations* given her repudiation of a vacuum and her endorsement of the non-atomic nature of matter's parts in that book. But even here, he notes how material parts' interrelations 'recall atomic interactions' (p. 262). Jay Stevenson, 'The Mechanist–Vitalist Soul of Margaret Cavendish' ['Mechanist–Vitalist'], *Studies in English Literature*, 36 (1996), 536. Stevenson's concerns and approach are very different from my own. He believes that the persisting atomism in Cavendish's work is a reflection of Cavendish's conception of psychology, and that her disingenuous attempts to disguise her enduring atomism are in themselves informative of her psychological theories. I appeal to his article because he has identified what I take to be a real difficulty with Cavendish's atomism that (I believe) requires treatment if we are to make sense of her natural philosophy. Moreover, resolving this difficulty is also helpful in dealing with her monism and theory of occasional causation. So, while Stevenson's focus is on human psychology, mine is on her broader natural philosophy, though my conclusions have consequences for any part of nature, including her theory of psychology. In offering the following account of Cavendish's natural philosophy, I start from the assumption that Cavendish's philosophy is internally coherent, and I try to find that coherence. I take that guiding assumption to be anathema to Stevenson's overall project. Robert Hugh Kargon also thinks Cavendish is an atomist, but he seems to hold this belief because he focuses exclusively upon the *Poems*, the only book in which it is clear that Cavendish endorses atomism. Robert Hugh Kargon, *Atomism in England from Hariot to Newton* (Oxford: Clarendon Press, 1966), 73–6.

argument in order to refute Stevenson's claim that Cavendish would like to abandon atomism in her mature thought but cannot do so for reasons internal to her philosophy. The normative argument, I contend, is not directly about matter at all. Rather, it is about the free causal agency of individuals, and the argument is meant to establish prescriptions about normatively good behaviour among these individuals. They ought not to behave atomistically, distinct from all others as if not bound together by common norms.[5] Disorders, then, arise from free actions of individuals, whether those individuals belong to a material world composed of atoms or a plenum. An atomistic theory of *matter* is not necessary in order to account for disorders, *pace* Stevenson's claim. Yet, while the normative argument does not lead directly to a conclusion about the nature of matter, Cavendish clearly links this argument with a non-atomistic matter theory. So I show how she might use this argument to reach indirectly the conclusion that matter is a plenum and not atomistic. This leads us to a distinctive feature of her overall philosophy—that she often conceives of the non-human natural world in terms of the human, social world, which is explanatorily primary for her.

Understanding Cavendish's normative argument against atomism in this way also allows us to contrast her general philosophy of nature with that of Spinoza (Section 6), a valuable contrast to draw since her system resembles his in many striking ways.[6] Cavendish endorses a monistic conception of nature, but this is prima facie at odds with

[5] Anna Battigelli also notes this element of Cavendish's ideas on atomism: 'Cavendish's interest in atomism was less an interest in physical theories of matter than a fascination with a metaphor that served to explain political and psychological conflict ...' (Anna Battigelli, *Margaret Cavendish and the Exiles of the Mind* [*Exiles*], (Lexington: University Press of Kentucky, 1998), 49). See also, Emma L. E. Rees, *Margaret Cavendish: Gender, Genre, Exile* [*Gender*] (Manchester: Manchester University Press, 2003), 57. I agree with Battigelli and Rees on the normative element of Cavendish's concern with atomism, but she is also, I shall argue, interested in matter theory and the relation between matter and politics.

[6] I am not making a historical claim here. Cavendish and Spinoza were rough contemporaries, but Cavendish would not have been familiar with any of his work as she read only English, and none of his texts were translated into English during her lifetime. Rather, there are many points of conceptual affinity between the two, an insight made by Susan James. See 'The Philosophical Innovations of Margaret Cavendish' ['Innovations'], *British Journal for the History of Philosophy*, 7/2 (1999), 219. There are crucial differences between the two, and perhaps the principal one is the fact that Cavendish, but not Spinoza, believes that a transcendent, immaterial God exists. While she claims to bracket discussions of God in natural philosophy, leaving considerations of him to the theologians (e.g. *PL* 3, 142; *OEP* 217), she does occasionally appeal to God in order to make sense of the natural world; see

her theory of occasional causation. On the one hand, according to an especially robust conception (Spinoza's, for example), monism amounts to a belief that there is just one natural substance—the whole of infinitely extended nature—and this substance acts as the sole principal (and necessitating) cause of all effects. On the other hand, Cavendish's occasional theory of causation seems to require multiple finite individuals, each acting freely as a self-determining principal cause. Understanding the precise character of her normative argument against atomism allows us to see the limits of her monism such that her theory of occasional causation is preserved, and this shows that her philosophy of nature is unique in the seventeenth century, mimicking not even that of Spinoza, conceptually one of her closest contemporaries.

2. CAVENDISH'S LOGICO-MATHEMATICAL ARGUMENT AGAINST ATOMISM

Cavendish provides two key arguments against atomism in her corpus: what I call the normative argument (to be dealt with in the next three sections) and the logico-mathematical argument. The logico-mathematical argument against atomism depends upon Cavendish's

n. 37 below. For work on Cavendish's relations with others of her contemporaries, see the growing body of secondary literature on this, including Neil Ankers, 'Paradigms and Politics: Hobbes and Cavendish Contrasted', in Stephen Clucas (ed.), *A Princely Brave Woman: Essays on Margaret Cavendish, Duchess of Newcastle* (Aldershot: Ashgate, 2003), 242–54; Battigelli, *Exiles*; Jacqueline Broad, *Women Philosophers of the Seventeenth Century* [*Women Philosophers*] (Cambridge: Cambridge University Press, 2002), ch. 2; Sarah Hutton, 'In Dialogue with Thomas Hobbes', *Women's Writing*, 4/3 (1997), 421–32; Sarah Hutton, 'Anne Conway, Margaret Cavendish and Seventeenth-Century Scientific Thought', in Lynette Hunter and Sarah Hutton (eds.), *Women, Science and Medicine, 1500–1700: Mothers and Sisters of the Royal Society* (Phoenix Mill: Sutton, 1997), 218–34; Sarah Hutton, 'Margaret Cavendish and Henry More', in Clucas (ed.), *A Princely Brave Woman*, 185–98; James, 'Innovations', 219–44; Eve Keller, 'Producing Petty Gods: Margaret Cavendish's Critique of Experimental Science', *English Literary History*, 64 (1997), 447–71; O'Neill, 'Introduction', pp. x–xlvii; Lisa T. Sarasohn, '*Leviathan* and the Lady: Cavendish's Critique of Hobbes in the *Philosophical Letters*' ['*Leviathan* and the Lady'], in Line Cottegnies and Nancy Weitz (eds.), *Authorial Conquests: Essays on Genre in the Writings of Margaret Cavendish* (Madison, Wis.: Fairleigh Dickinson University Press, 2003), 40–58; Elisabeth Strauss, 'Organismus versus Maschine. Margaret Cavendish' Kritik am mechanistischen Naturmodell', in J. F. Maas (ed.), *Das Sichtbare Denken. Modelle und Modelhaftigkeit in der Philosophie und den Wissenschaften* (Amsterdam: Rodopi, 1993), 31–43; and Jo Wallwork, 'Old Worlds and New: Margaret Cavendish's Response to Robert Hooke's *Micrographia*', *Women's Writing 1550–1750*, 18/1 (2001), 191–200.

rejection of a vacuum or empty space as logically inconceivable—what is not anything cannot exist (e.g. *PL* 452)—together with her implicit mathematical belief in the infinite divisibility of matter. For example: 'there can be no atom, that is, an indivisible body in nature; because whatsoever has body, or is material, has quantity; and what has quantity, is divisible' (*OEP* 125; cf. 263); the 'Nature of a Body ... is, to be divisible. ... it is impossible for a Body ... to be indivisible' (*GNP* 239). There cannot exist natural minima, therefore, because no part of matter is physically distinct from the rest of nature owing to empty space separating that part from all others. Furthermore, Cavendish rejects empty space *beyond* nature too (*OEP* 130–1). Nature as a whole is not an atom either, therefore, because it is not a material minimum; it is spatially infinite. And within the infinitely extended material plenum, no single part is indivisible, and so no single part is a minimum unit. In spite of the strength of this argument, based on the mathematical premiss that matter always has quantity and so is always divisible, Clucas maintains that we cannot interpret Cavendish as rejecting atomism. He challenges the anti-atomism interpretation of her later philosophy along at least two fronts. First, Cavendish actually 'accepts, for example, that matter is not infinitely divisible', thus allowing for natural minima, or atoms. Second, atomism in the seventeenth century is not a single category, and it is really only 'the simple mechanism of "classical atomism" ' that Cavendish rejects.[7]

It is true that Cavendish occasionally denies the infinite divisibility of matter: 'one part cannot be either infinitely composed, or infinitely divided' (*PL* 158). Two things can be said in the face of such passages. First, there are at least as many passages (such as the two cited above) in which Cavendish asserts the divisibility of matter as long as it is extended. This fact, together with the fact that matter is partly defined by quantity of extension, means matter will be divisible no matter how small it gets, and this is tantamount to infinite divisibility. Cavendish herself recognizes that she is not always unequivocal in her writings, but her equivocations seem to be partly due to her actively working through and developing her thoughts on paper.

[7] Clucas, 'Reappraisal', 259 ff. For a historical account of atomism that displays the complexity of the doctrine, see Andrew Pyle, *Atomism and its Critics: Problem Areas Associated with the Development of Atomic Theory of Matter from Democritus to Newton* (Bristol: Thoemmes Press, 1995).

'An Argumental Discourse' in her *Observations upon Experimental Philosophy* (*OEP* 23–42; hereafter *Observations*), and the weighing of opposing positions against each other in *Orations of Divers Sorts*, are just two obvious examples of this process transparently at work in her corpus. Most often, however, a settled position on a given topic can be found in Cavendish, often when she herself offers elucidations and corrections of past views in light of more careful thought. 'An Explanation of Some obscure and doubtful passages occurring in the Philosophical Works, hitherto published by the Authoresse' included in the early pages of the first edition of the *Observations* (though excised from the later) is a classic example.[8] If we take her philosophy to be maturing, then we should take the infinite divisibility of matter to be her settled position since the passage against this position that Clucas cites, and the only others that I have found, are from her 1664 *Philosophical Letters* (hereafter *Letters*) or earlier, while those favouring infinite divisibility appear in 1666 and later.

Second, more substantially, a close study of the passages in the *Letters* that seem to deny matter's infinite divisibility shows that it is not clear that this is what Cavendish is actually doing in those passages. Rather, she seems to be doing two different things. First, she seems to be denying that an *actual* infinite division can occur if a body also happens to be compounded into a finite unity: 'the Compositions hinder the Divisions in Nature, and the Divisions the Compositions' (*PL* 51; cf. 158). This seems to be a point about what is actual rather than possible, and the tendency of matter to compound into finite beings hinders the tendency of matter to divide without limit, but this does not preclude the infinite divisibility of matter. Second, she is comparing the parts of nature to nature as a whole, and she says that the whole of nature, as infinite, is infinitely divisible, but the parts of nature, as finite, cannot be infinitely divisible. '... for infinite composition and division belong onely to the Infinite body of Nature, which being infinite in substance may also be infinitely divided, but ... a finite and single part' cannot be infinitely divided (*PL* 158). How so? Cavendish seems to think that a body that is infinitely divisible has infinitely many parts, and that this, in turn, means that the body itself is infinitely large. This can be said of nature as a whole only, but not of a finite part within nature. She

[8] Margaret Cavendish, *Observations upon Experimental Philosophy* (London, 1666), 45–68.

is wrong, of course, that a body with infinite parts must be infinitely large. As the infinitesimal calculus would eventually prove, as long as the infinite parts are infinitely small, the composition will be finite. But Clucas is wrong to believe that what Cavendish denies in these passages is that matter can be divided without end. I think Cavendish *does* believe that matter is divisible without end, and this is in accord with her later claims that 'whatsoever ... is material, has quantity; and what has quantity, is divisible' (*OEP* 125), together with her belief that 'Nature ... is material; and if material, it has a body; and if a body, it must needs have a bodily dimension; and so every part will be an extended part' (*PL* 158). And so every part, no matter how small, is divisible.

The second reason Clucas gives for endorsing the atomistic interpretation of Cavendish's later philosophy—that Cavendish rejects only mechanical atomism and not all forms of atomism—also has some textual support. After all, in the 'Condemning Treatise' from which I quoted at the outset of this chapter, Cavendish does seem to imply that if every atom were 'a living substance', at least some of the difficulty with (classical, mechanical) atomism would be alleviated. Thus, Clucas believes that Cavendish

> retains a residual attachment to the broad principle of atomic structure. Her objections, it seems, are to the idea of *mechanical* atomism. She cannot accept that the collision and chance motion of atoms 'fleeing about as dust and ashes, that are blown about with winde' can account for the orderly composition of the material fabric of nature, with its 'undissolvable Laws' and 'fixt decrees'. Chance collisions, she felt, could only produce 'wandring and confused figures' and 'eternal disorder'.[9]

Clucas here takes the fact that nature is orderly and harmonious to establish that Cavendish may need a 'vitalist' conception of nature to explain this fact, with vitalism understood as a theory that attributes life, sense, and reason to matter. It seems especially crucial that nature be supposed to possess such features given that Cavendish also believes we can make no appeals to God in our natural investigations, and so one obvious source of order is precluded from natural explanations (*PL* 3, 201–11). Thus, while Cavendish rejects the non-teleological, chance-based mechanical atomism, Clucas believes that she is still an

[9] Clucas, 'Reappraisal', 261. Clucas here quotes Cavendish, 'Condemning Treatise', A3^{v}.

atomist, and 'Cavendish's atomism is a synthesis of materialism and vitalism.'[10] Still, given what I believe is a necessary commitment to the infinite divisibility of matter, Cavendish's arguments against atomism must be at least rejections of material units as *minima naturalia*.[11] But since this is a sufficient condition for atomism, her logico-mathematical argument is decisive in establishing the impossibility of any form of material atomism whatsoever. Thus, we can reasonably conclude that Cavendish's matter theory is one of a living, sensing, reasoning material plenum, rather than perceptive atoms.

It seems that the job is done and that the non-atomistic conclusion is reached. But while Cavendish certainly appeals to the logico-mathematical refutation of atomism, she clearly favours the normative argument which appears with notable frequency. Given this, and given that I think this latter argument tells us a great deal about her philosophy of nature in general, I now consider that argument in order to determine just what role it plays in Cavendish's philosophy.

3. CAVENDISH'S NORMATIVE ARGUMENT AGAINST ATOMISM

I call Cavendish's second argument against atomism her normative argument because it is based on the assumption of norms or standards in nature. Specifically, it is premissed on the beliefs that there is a standard of order or harmony, and that perversions from this standard cause true disorders and can rightly be denounced.[12] There are two crucial assumptions in this argument that must be borne in mind throughout this discussion. First, there are objective norms, distinct from human convention and from our subjective beliefs that there are norms.[13]

[10] Clucas, 'Reappraisal', 261–2.

[11] For further scepticism (in light of Cavendish's own texts) about Clucas's claim that she retains atomism, see also Broad, *Women Philosophers*, 43.

[12] My full reasons for calling this a 'normative' argument will come clear in Sections 4 and 5 below.

[13] I argue elsewhere for how Cavendish might convincingly attribute objective norms and standards to the natural world such that we might consider some events (e.g. civil war, disease) to be true perversions and not just apparent perversions, erroneously believed to be true perversions by humans with a particular, subjective, and finite perspective. For the purposes of this chapter, I simply grant that Cavendish is entitled to this assumption. See my 'Reason and Freedom'.

Second, Cavendish thus recognizes that there are true perversions from these norms. There are real disorders and disharmonies in nature. These are not merely our finite way of perceiving events in the natural world that are, from an infinite perspective, perfectly orderly. So, for example, she says that there is an overall law of peace and order that nature as a single, principal cause imposes upon her parts: 'I say Nature hath but One Law, which is a wise Law, *viz.* to keep Infinite matter in order, and to keep so much Peace, as not to disturb the Foundation of her Government: for though Natures actions are various ... yet those active Parts, being united in one Infinite body, cannot break Natures general Peace' (*PL* 146).[14] While this is rather vague, we may reasonably take it as a claim about nature's overall plan to impose order through, for example, laws (or, at least, through regularities). Another example of nature's norms is that nature as a whole dictates what natural kinds or species will be found among her natural parts—natural kinds that are defined by their figure or shape and that (as universals) are eternal (*OEP* 197, 202–3; *GNP* 234–5). Perversions from nature's kinds are monsters (*OEP* 240), natural beings behaving in an 'irregular' fashion leads to diseases (*PL* 408–9), and individuals can sin thus rightfully incurring God's punishment (*PL* 348–50). These examples presuppose the existence of norms independent of human conventions, and they indicate that finite individuals can diverge from these norms.

Here is one textual example of the normative argument: 'were there a vacuum ... a piece of the world would become a single particular world, not joining to any part besides itself; which would make a horrid confusion in nature, contrary to all sense and reason' (*OEP* 129; cf. 169, 207–8; *GNP* 4).[15] Taking a piece of the world that becomes 'a single particular world' as an atom, this argument can, for now,

[14] This is a troublesome passage for Cavendish, and for reasons that become clear in Section 4 below. See n. 23.

[15] Cavendish here notes the natural confusion that would be spawned not just if atomism were true, but also if there were vacua. On this point, she is in accord with several late medieval and Renaissance commentators on and promulgators of Aristotle, many of whom believe that the existence of vacua would sunder the love and union found among material bodies in a plenum. Toletus and the Coimbrans are notable examples. See e.g. Charles Schmitt, 'Experimental Evidence for and against a Void: The Sixteenth-Century Arguments', *Isis*, 58 (1967), 352–66; and Edward Grant, *Much Ado about Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Cambridge: Cambridge University Press, 1981).

be concisely stated thus: if atomism were true, then there would be only disorder in the natural world; but experience makes clear that the natural world is orderly; and so atomism cannot be true.

The assumption that atomism would result in disorder is unfounded, and it is especially suspect in light of the atomism of some of those in her immediate intellectual circle. Gassendi, for example, locates the ultimate source of the motion of atoms in God, thus ensuring order and harmony against the disorder that Cavendish assumes will befall the atomist's picture of nature (*Opera*, i. 337A).[16] Indeed, questioning the first premiss is precisely the second point I attribute to Clucas: Cavendish might refute her own normative argument against atomism simply by recognizing the viability of forms of atomism *other than* mechanical atomism together with its premiss of the chance encounter of passive, non-perceptive minimum material units. That is, it is not atomism that causes problems. Rather, the concern is with the chance-ladenness of bits of matter moving through space and aimlessly colliding. Moreover, Cavendish herself seems to concur, for she occasionally seems to believe that atomism would be acceptable as long as the atoms are perceptive: 'there can be no regular motion, without knowledge, sense and reason: and therefore those who are for atoms, had best to believe them to be self-moving, living and knowing bodies, for else their opinion is very irrational' (*OEP* 129). We get a similar suggestion when she challenges Epicurus' natural explanations: 'nor is this visible world, or any part of her, made by chance, or a casual concourse of *senseless and irrational* atoms' (*OEP* 264; my emphasis; cf. *OEP* 168–9). Thus, the normative argument would need to be more specific, with the first premiss reflecting Clucas's claim that only certain forms of atomism are inadequate for explaining nature's harmony and order: if nature were comprised of *non-rational, non-sensing* atoms, then there would be only disorder in the natural world; but experience makes clear that the natural world is orderly; and so *this specific form* of atomism cannot be true. But then the normative argument does not preclude all forms of atomism.

Cavendish, however, also goes further, rejecting even a form of atomism like the one that Clucas suggests. Even on the supposition

[16] Cavendish would reject Gassendi's account on the basis of our ignorance of God's nature and the precise relation between him and the world (e.g. *PL* 139, 141, 186–7; *OEP* 17), and this might account for the underlying assumption in her argument.

of 'self-moving, living and knowing' atoms, order would be wanting. Seemingly on any atomist thesis, nature would not

> be able to rule those wandering and straggling atoms, because they are not parts of her body, but each is a single body by itself, having no dependence upon each other. Wherefore, if there should be a composition of atoms, it would not be a body made of parts, but of so many whole and entire single bodies, meeting together as a swarm of bees. The truth is, every atom being single, must be an absolute body by itself, and *have an absolute power and knowledge*, by which it would become a kind of deity; and the concourse of them would rather cause a confusion, than a conformity in nature; because, all atoms being absolute, they would all be governors, but none would be governed. (*OEP* 129; my emphasis)[17]

As this passage makes clear, there is something about atomism *per se* that invites disorder. Even a form of atomism in which the atoms have 'power and knowledge'—atoms that are *not* inert and irrational—cannot avoid this outcome.

This brings us to Stevenson's reason for believing Cavendish must be an atomist. He writes:

> She ... disguise[s] her philosophy, claiming disingenuously to have revised her old views. ... Her retraction [of atomism] should not be taken at face value because the problem of [*absolute individuals*] hardly agreeing [in their actions—which Cavendish recognizes actually happens] is precisely what Cavendish's atomistic philosophy explains so well. In spite of her promise to theorize a more stable cosmic order. ... [the] essential features of her philosophy—the physicality, *autonomy*, and reflexivity of thinking things ... are preserved.[18]

According to Stevenson, the second premiss of the normative anti-atomism argument as presented above is denied by Cavendish herself elsewhere in her writings. Cavendish clearly allows that the world seems to be at least partly comprised of absolute individuals acting autonomously and therefore not in accord with stable cosmic norms. Cavendish herself frequently discusses cases of disorders which she

[17] It is unfortunate that Cavendish here chose a swarm of bees as the simile for a material world composed of atoms since a hive of bees when governed by a queen is an ideal natural model of a hierarchically organized society. See e.g. Thomas D. Seeley, *The Wisdom of the Hive: The Social Physiology of Honey Bee Colonies* (Cambridge, Mass.: Harvard University Press, 1995); and Charles D. Michener, *The Social Organization of Bees: A Comparative Study* (Cambridge, Mass.: Harvard University Press, 1974).

[18] Stevenson, 'Mechanist–Vitalist', 536; my emphases.

takes to be true perversions from objective, human-independent norms: humans' disorderly behaviour in, for example, civil wars (*NBW* 75; *ODS* 135–6) and the disharmonious behaviour of various organic parts leading to diseases in living bodies (e.g. *PPO* 43–4; *PL* 408–9; *GNP* 157–8) are two of her favourite examples. The natural world (both human and non-human) is *not* orderly and harmonious, or at least, it is not ubiquitously so. But since atomic individuals will, according to Cavendish, act in a disorderly fashion, then it is possible that the disorders that we do experience (and that she acknowledges are true of the world) are a result of the fact that atomism obtains. This conclusion holds on either version of atomism currently under consideration: disorder could arise either from non-perceptive atoms moving without an intelligent guide, or from rational atoms moving autonomously according to their own reasons that do not accord with the reasons of other atoms.

In sum, we can represent Cavendish's normative argument as follows: (1) if any form of atomism were a true account of matter, even a form according to which atoms are perceptive and self-moving, then disorder in the natural world would ensue; (2) the natural world is orderly; (3) therefore, no form of atomism is a true account of matter. In the spirit of Clucas's general approach, we can ask why we should accept the first premiss. That is, why would a form of atomism in which atoms have sense and reason result in disorder, while a material plenum of sensing, reasoning, and infinitely divisible matter would not result in disorder? Stevenson explicitly reminds us that the second premiss is denied by Cavendish herself. We can ask how, if at all, Cavendish might account for the fact that not all natural events are orderly and harmonious while still rejecting atomism as a theory of matter (and thus as a plausible explanation for the disharmony). To make sense of Cavendish's normative argument in the face of these serious criticisms, we need to revisit precisely what it is that she is trying to establish with the normative argument.

4. REINTERPRETING THE NORMATIVE ANTI-ATOMISM ARGUMENT: THE SECOND PREMISS

I believe that Cavendish's normative argument against atomism is considerably more sophisticated and interesting than presented in

the previous section, and, in its sophisticated form, it avoids the criticisms sketched above. I offer an interpretation of this sophisticated argument in this and the following section. Crucially, the following interpretation is not systematically laid out in Cavendish's work itself, but there is textual evidence for many aspects of it, and it makes sense to interpret her philosophy in this light given that it brings disparate parts of her thought together into a conceptually coherent whole. So the following should be taken in the spirit of creative reconstruction of a position that we may fairly attribute to Cavendish (and, moreover, which I believe Cavendish would accept).

Cavendish's normative argument against atomism is based upon a specific method. She starts by observing effects, and she then speculates about the causes of them. Specifically, she starts with the observation that the natural world is orderly (these are the empirically known effects), and so the cause that gives rise to that order cannot be atomism (for reasons soon to be made clear). Yet as her own discussion of wars and diseases (for example) indicates, the effects we observe in nature are *not* all orderly, but there are disorderly perversions of norms, so we must find a cause that is capable of explaining both the fact that nature is, by and large, harmonious and the fact that it is sometimes not so. To identify this cause of both orderly and disorderly natural effects, we must first consider both Cavendish's account of freedom and her account of natural individuals.

Cavendish endorses a libertarian account of freedom, according to which finite material parts of the natural world, having both self-motion and reason, are capable of determining their own actions conforming to their own reasons, rather than being determined to act in a specific way by something extrinsic to them. At the same time, finite material parts do not thereby necessarily act without reference to other material parts, precisely because they are rational. Finite parts may consent to the rational suggestions made to them by other parts to behave in certain ways. A great deal can be said about Cavendish's theory of freedom and its relation to her theory of rational matter, especially in light of the debate between Hobbes and John Bramhall on necessity and freedom of the will. Indeed, the initial discussion between Hobbes and Bramhall occurred in the Cavendish household the year Margaret wed William Cavendish (1645), and it is likely that Cavendish knew the general positions of that debate.

For our purposes, however, we need only recognize that she does attribute such freedom to material parts: 'if man (who is but a single part of nature) hath given him by God the power and a free will of moving himself, why should not God give it to Nature?' (*PL* 95). Notice, that while Cavendish assimilates the human and nature (*OEP* 49), she does not thereby believe that the human is causally necessitated in the way that we generally think nature is, and, on this point, she disengages materialism and determinism, endorsing the former while still rejecting the latter. And so, the converse holds: we assimilate nature to how we think of humans, and no part of nature is necessitated (*OEP* 109).[19] Cavendish's belief that all parts of nature in and of themselves are free implies that nature *as a whole* does not causally determine its parts, and Cavendish says explicitly that nature therefore does not have knowledge of the future actions of its parts: 'That by reason every Part [of nature] had Self-motion, and natural Free-will, Nature [as a whole] could not foreknow how they would move ...' (GNP 102). This implies that the freedom she attributes to finite parts is a freedom that permits of the ability to act differently from how they actually will act; it implies, to reiterate, a libertarian conception of freedom. This is why nature as a whole with infinite wisdom cannot foreknow the actions of its parts.[20]

But what are these finite individuals that can act as libertarian free agents on Cavendish's account? Cavendish indicates that finite individuals obtain in nature when a portion of infinite matter takes on a specific figure or material shape, maintains that shape by its parts having a special natural affinity or sympathy for one another (e.g. *PL* 292), and thus becomes a natural individual within the whole of active matter, an individual whose parts conspire together towards

[19] Lisa T. Sarasohn notes the parity between Cavendish and Hobbes on their likening of human nature to the rest of nature, and Sarasohn also notes Cavendish's exalting of animals in contrasted with Hobbes's lowering of the human. Sarasohn, '*Leviathan* and the Lady', 49–50. It should be noted that it is not just animals that Cavendish 'exalts' but all of non-human nature. This is because, as Sarasohn points out, Cavendish asserts 'a principle of freedom in its [the universe's] very constitution' (p. 45). Sarasohn's article is informative on Cavendish's theory of freedom, though Sarasohn's primary interest is with a comparison and contrast between Cavendish's and Hobbes's political views as opposed to my interest with Cavendish's matter theory and natural philosophy, together with the political background to these aspects of her thought.

[20] I deal with Cavendish's position on freedom and how this relates to her theory of rational matter in my 'Reason and Nature'.

the common goal of remaining unified and rationally reacting to other beings in its environment. Each finite individual has its own capacity to move itself owing to the fact that it has its own share of moving matter, and it moves itself according to its own sense and reason (e.g. *OEP* 207). There is really only one whole—all of infinite nature—and what we think are finite wholes within nature are actually just temporarily stable figures, causally contributing at least in part to their own endurance, unity, and stability. Finite individuals are temporary centres of sense, reason, and self-motion. She writes:

> for as 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; so there are also particular natures in every creature, which are the innate, proper and inherent interior and substantial forms and figures of every creature, according to their own kind or species. ... and these particular natures are nothing else but a change of corporeal figurative motions, which make this diversity of figures. (*OEP* 197)

Precisely because these finite individuals are centres of reason and self-motion, they can freely choose to respond rightly to the rational suggestion of other finite parts to behave in accordance with nature's overarching order—thus explaining natural order—or they may freely choose to respond in a way that disrupts this order—thus explaining natural disorder.

A difficulty comes about when we try to reconcile Cavendish's belief in radically free, finite parts that have the power to act in a disorderly, irregular fashion with passages such as this:

> it is more easier, in my opinion, to know the various effects in Nature by studying the Prime cause, then by the uncertain study of the inconstant effects to arrive to the true knowledge of the prime cause; truly it is much easier to walk in a Labyrinth without a Guide, then to gain a certain knowledge in any one art or natural effect, without Nature her self be the guide, for Nature is the onely Mistress and *cause of all*. (*PL* 284; my emphasis)

That is, precisely because nature is the one, single whole individual, how does Cavendish preserve the freedom of finite parts against the causal necessitarianism of, for example, Spinoza's account of nature?

Help in easing this difficulty can be found by probing further the issue of freedom, and we can turn to the Hobbes–Bramhall debate

for this help. I do not mean to indicate that Cavendish was directly influenced by specific elements of that debate (though she might well have been—after all, the debate took place in her husband's household around the time he and Cavendish wed), and so I am not making a historical claim.[21] Rather, I think that a solution implicit in Cavendish's system is explicit in the Hobbes–Bramhall debate, and examining that solution first in its explicit form is helpful for then locating it in Cavendish's philosophy. In his response to Bramhall's *Discourse of Liberty and Necessity*, Hobbes confesses a lack of understanding of Bramhall's distinction between moral and natural efficacy (*EW* iv. 247) when it comes to God's acting upon the human will. Bramhall clarifies:

> the will is determined naturally when God Almighty ... does ... concur by a special influence, and infuse[s] something into the will ... whereby the will is moved and excited and applied to will or choose this or that. Then the will is determined morally when some object is proposed to it with persuasive reasons and arguments to induce it to will. Where the determination is natural, the liberty to suspend its act is taken away from the will; but not so where the determination is moral. In the former case, the will is determined extrinsically, in the latter intrinsically.[22]

Adjusting this picture to Cavendish's theory of nature, we can think of the causal relation between nature as a whole (as opposed to God, as for Bramhall) and all of nature's sensing, rational parts (as opposed to just human wills, as for Bramhall) as potentially having two aspects: the whole of nature might have natural efficacy with respect to its

[21] Nonetheless, Cavendish had unusual access to the thought of Hobbes, even given the fact that she could not read any of his work not written in English. She did meet him while they were both in exile in Paris, and her husband and his brother Charles were tutored by Hobbes in the early 1630s. Margaret herself discussed metaphysics and natural philosophy extensively with her husband and brother-in-law—the conversations with her brother-in-law taking place primarily while the two were in England during several months in 1651–2 attempting to secure family property. Between her first-hand acquaintance with Hobbes and his work and second-hand knowledge through conversations with those friendly to her philosophical ambitions, she may well have been knowledgeable about his ideas on freedom. For details on Cavendish's life and acquaintances, see recent intellectual biographies by Anna Battigelli, Emma Rees, and Katie Whitaker: Battigelli, *Exiles*; Rees, *Gender*; and Katie Whitaker, *Mad Madge: The Extraordinary Life of Margaret Cavendish, Duchess of Newcastle, the First Woman to Live by her Pen* (New York: Basic Books, 2002).

[22] John Bramhall, *A Defence of True Liberty from Antecedent and Extrinsecall Necessity* (London, 1655); facs. repr. with introd. G. A. J. Rogers (London: Thoemmes, 1996), 171, 57–8.

parts, and nature might have moral efficacy with respect to its parts. Now, according to a necessitarian interpretation of nature, nature as a single whole exercises both natural and moral efficacy over its parts which are, to recall, merely effects of the principal cause that is all of nature. To be naturally or physically efficacious over its parts, nature as a whole presumably determines, from the top down, the precise quantity, direction, and so forth, of motion, thus determining each part's individual actions which would be mere effects and not causes. This sort of determination is precisely the source of Cavendish's problem because, if this were true of nature's relationship to its parts, then the libertarian account of freedom would be impossible, and yet she clearly wants such freedom for finite natural parts.

To preserve this freedom, we need to deny that nature is sole principal cause in this natural, physical sense. Rather, we must take finite individuals to be principal causes in the sense of being naturally or physically efficacious of their own actions. Cavendish certainly allows for this given her conception of finite individuals as rational centres of self-motion—stable, material figures that have consolidated their own motive power and share of reason so as to do physically the bidding of reasons they give to themselves for their action. So, nature as a whole is not the principal natural or physical cause of individual's free actions. There is a second possible way that it can act efficaciously towards its parts: it can act as morally efficacious cause. In exercising moral efficacy over its parts, nature simply proposes 'persuasive reasons' to induce the parts to move themselves in specific ways. Indeed, Cavendish does seem to attribute this sort of efficacy to nature as a whole. Nature has infinite wisdom (*GNP* 11) by which she knows and orders her parts (*PL* 8–9), and this order takes the form of a single, overall law of peace (*PL* 146), as well as the form of prescribing that certain natural kinds obtain (*OEP* 197). But, again learning from Bramhall, nature as a whole, acting as morally efficacious cause, does not necessitate nature's parts. It simply tries to persuade natural parts to respond in a specific way. Furthermore, nature's finite parts also act as morally efficacious causes (in addition to being physically or naturally efficacious) because they are self-motivated (intrinsically motivated) to act according to their own rational response to the rational suggestion given to them by nature as a whole (or by other parts within nature as a whole) to act in a specific fashion.

Making this distinction between natural (physical) and moral efficacy, attributing moral efficacy to the whole of nature, and attributing both moral and natural efficacy to nature's finite parts, thus preserves libertarian freedom and provides an explanation for the brute, experienced facts of disorder amid a general orderliness of nature. Making this distinction accounts for libertarian freedom by allowing that finite parts' actions are intrinsically generated and follow from reasons that those finite parts give to themselves, and these reasons may or may not accord with the rational suggestion to act in specific ways made to them by other finite parts or the whole of nature. And the distinction between natural and moral efficacy permits an explanation of disorders by saying that they are the result of finite parts refusing to abide by proper reasons given to them to act in an orderly fashion. Thus (as suggested by Stevenson's concern), Cavendish says repeatedly that nature in general may be orderly and harmonious, but there are still some disorders in nature that come from the parts refusing to abide by nature's overarching order.

> ... some [various motions in Nature] are Regular, some Irregular: I mean Irregular as to particular Creatures, not as to Nature her self, for Nature cannot be disturbed or discomposed, or else all would run into confusion; Wherefore Irregularities do onely concern particular Creatures, not Infinite Nature; and the Irregularities of some parts may cause the Irregularities of other Parts. ... And thus according as Regularities and Irregularities have power, they cause either Peace or War, Sickness or Health ... to particular Creatures or parts of Nature ... (*PL* 238–9; cf. 279–80, 344–5; *OEP* 13, 33–4)[23]

[23] There is a tension between the implication here that there are irregularities in nature due to the power or actions of parts, and the passage cited near the start of Section 3 which says that the 'active Parts, being united in one Infinite body, cannot break Natures general Peace' (*PL* 146). The former indicates that the parts can cause irregularities that violate nature's peace while the latter indicates otherwise. One way of easing the tension is to say that parts may well be irregular and may therefore cause less than peaceful actions within nature, but this does not undermine nature's general order, which, prescriptively, remains the same and which nature as a whole continues to suggest to its parts. Moral efficacy works from the top down with nature suggesting a correct course of action to the parts, and it works from part to part with one finite part suggesting a course of action to another finite part. But the parts do not determine the whole *morally*, for nature as a whole continues to prescribe the same general peace to all its parts, orderly and unruly alike.

Jacqueline Broad discusses the teleological character of Cavendish's philosophy, and by this, Broad seems to mean an approach that takes the world to be orderly and harmonious

So Stevenson's concerns about the second premiss of the argument can be put to rest without forcing an atomistic account of matter onto Cavendish. Finite individuals as stable figures within a material plenum can be the source of both nature's general order and particular disorders. It is not necessary to call upon atomism to explain the latter. Indeed, when denying the truth of the second premiss in the normative argument (that is, when denying nature's ubiquitous harmony), this merely opens the possibility of atomism. It does not necessitate its truth. And indeed, as just presented, there is another way of accounting for these disorders within a non-atomistic account of matter.

Nonetheless, continuing to bracket the decisiveness of the logico-mathematical argument, atomism is still possible. Moreover, as is implicit in the first premiss of the normative argument, Cavendish herself associates the normative argument with a conclusion about matter theory. So we should probe further by focusing now on that first premiss. Why should we believe that if any form of atomism were a true account of matter, even a form according to which atoms are perceptive and self-moving, disorder in the natural world would ensue? Why would this form of atomism result in disorder, while a material plenum of sensing, reasoning, and infinitely divisible matter would not result in disorder?

5. REINTERPRETING THE NORMATIVE ANTI-ATOMISM ARGUMENT: THE FIRST PREMISS

In order to answer this question, we need to see Cavendish's normative anti-atomism as, in fact, much more significantly normative, indeed

(Broad, *Women Philosophers*, 43). But this does not seem enough to secure a teleological account of nature, for a material world moving in accordance with inviolable laws will also be orderly and harmonious, yet (witness Hobbes's natural philosophy) not one characterized by teleology. Even a thoroughly perceptive, self-moving natural world would not necessarily be an irreducibly teleological one (witness Spinoza's natural philosophy, especially his appendix following book 1 of the *Ethics*). This is the point at issue with the tension noted here. If, as the quote at *PL* 146 indicates, active parts of matter are *necessitated* to do what they do by the power of nature's 'general Peace', then the world can be one way, and one way only, and it is not clear how Cavendish's philosophy can escape Spinoza's arguments against finality in nature in the face of such necessitarianism. My interpretation of Cavendish—that nature exhibits irregularities due to the free choice of its parts, and also exhibits order due to the same free choice—both explains the source of Cavendish's teleology and alerts us to her divergence from the non-teleological, yet still orderly, nature of Spinoza's philosophy. Cavendish's teleology derives from nature's freedom, not its order.

prescriptively and not merely *descriptively* normative. That is, above I said that this argument is normative in the sense that it is based on the assumption of norms or standards in nature, but this is merely descriptive of nature. But perhaps the normative argument might actually be understood as follows: given that nature as a whole is infinitely wise and prescribes, from the top down, norms and standards of orderly and harmonious behaviour (nature as *morally* efficacious), an individual acting as if it were an atom—isolated from all others and bound by no overarching norms—would lead to disorder in its immediate environs at least. Because this violation of norms and standards of order would be bad, one ought not to behave as if one were such a being, even though our freedom permits exactly this sort of disorderly behaviour. This freedom comes about precisely because nature as a whole does not physically determine its parts. Rather, parts can determine their own physical movements. Individuals *ought not* to behave as if they were atomistic beings distinct from the whole of nature—beings with absolute power (including the power to set one's own norms of behaviour) that need not refer their actions to other individuals—because this will be potentially harmful to those other individuals.

A slightly different way of phrasing the argument is to say that if atomism were true, and if individuals could reasonably behave as if they were free from the constraints of other parts and of the whole of nature, then there would be no sense in saying that it is better to be healthy than to be sick, or to have sight than to lack it, to behave virtuously than to behave sinfully. But it is bad to be sick, to lack sight, or to sin (*GNP* 157–8, 85; *PL* 348–50).[24] And so natural parts *ought not* to behave with absolute freedom or without regard for others and for the whole of nature, since this leads precisely to such perversions. Yet another way of phrasing the argument is to acknowledge (as Cavendish does when employing the normative argument regarding atomism) that atoms are like deities, their behaviour in no way constrained, not even by norms (*PL* 431; *OEP* 129), for God produces norms, after all. He does not abide by extrinsically existing norms. But natural beings are neither like atoms nor like God. They are constrained by norms,

[24] It is crucial to bear in mind the content of n. 13. I note there that I assume that, for Cavendish, there are true norms in nature and, thus, true deviations from norms. While I merely assume it here, I do believe that she has a convincing argument for the assumption, and I deal with this elsewhere.

and they do not set norms for themselves by simply acting as they wish. Individuals within nature may act freely, but, in doing so, they may well violate norms, thus proving that they cannot rightly (even if they can literally) behave as if they were not defined in terms of their communities and ultimately in terms of all of nature.

Notice that, thus stated, Cavendish's normative anti-atomism says nothing about matter. This is an anti-atomism with atomism conceived of in a quasi-social way: one ought not to behave as if one were not part of a normatively guided community with other individuals. But this is still perfectly compatible with atomism as a theory about matter. Nature *could be* comprised of material atoms, but as long as there are overarching norms and standards guiding their behaviour, and as long as they abide by these standards, the prescriptions laid down by this new interpretation of the normative anti-atomism argument are satisfied. The first premiss as a statement about matter theory is still not established.

Two options arise at this juncture. First, we may completely disengage the two arguments found in Cavendish's corpus, laying the entire burden upon the logico-mathematical argument to establish the conclusion that matter is a plenum and not comprised of atoms. Accordingly, the normative argument (now in its normatively stronger form) is *not* an argument about matter theory at all. It is an argument concerned solely with establishing a conclusion about moral causal agency, most specifically the morally efficacious causal behaviour of finite beings. The normative argument establishes both prescriptive conclusions about how finite individuals with causal agency ought to conduct themselves as parts within the whole, and a descriptive conclusion about how most parts of the natural world seem actually to conduct themselves given that the world is, for the most part, orderly and harmonious.

The second option is to say that, while the normative argument surely leads to these prescriptive conclusions about the proper behaviours of finite beings, it can also lead to a conclusion about matter theory. Trying to show how it might do so has the triple virtues of (*a*) corresponding with Cavendish's own implicit belief that the normative argument tells us something about matter theory; (*b*) alerting us to the explanatory use to which Cavendish puts our experience of the sorts of social interactions we find among humans: Cavendish 'reads',

one might argue, the lessons learned from our experience of social relations into how she explains relations among natural material parts; and (*c*) showing how she differs from Spinoza in her philosophy of nature.

Cavendish was aware of Hobbes's *De corpore*, the first English translation of which appeared in 1656.[25] And so she would have been aware of his division of philosophy:

> The principal parts of philosophy are two. For two chief kinds of bodies, and very different from one another, offer themselves to such as search after their generation and properties; one whereof being the work of nature, is called a *natural body*, the other is called a *commonwealth*, and is made by the wills and agreement of men. And from these spring the two parts of philosophy called *natural* and *civil*. (*EW* i. 11)

She was also clearly aware of the 'body politic' analogy that appeared in Western philosophy from at least Plato and continued to appear through to the seventeenth century if not beyond.[26] According to the analogy, political systems (Hobbes's second part of philosophy, with the second kind of body as its subject) behave functionally as does the human body (Hobbes's first part of philosophy, with the first kind of body as its subject). Just as the human body necessarily has specific structures to allow healthy actions and functions, so too political systems necessarily must have specific structures to function appropriately, and both systems tend to be hierarchically organized. So, for example, in the *Laws*, Plato likens a state that is in peace

[25] As Cavendish herself is not shy about admitting, she could read only English (*PF* A6^{r}; *PL* C1^{v}). For various accounts of the relationship between Hobbes's and Cavendish's thought, see some of the sources in n. 6 above.

[26] For a sustained account of Cavendish's use of the body politic analogy, see Oddvar Holmesland, 'Margaret Cavendish's *The Blazing World*: Natural Art and the Body Politic', *Studies in Philology*, 96/4 (1999), 457–79. Catherine Wilson addresses the contrast between nature's orderly hierarchy and society's failure to exhibit the same degree of order ('Two Opponents of Material Atomism: Cavendish and Leibniz' ['Two Opponents'], in Pauline Phemister and Stuart Brown (eds.), *Leibniz and the English-Speaking World* (forthcoming)). For a helpful summary of the main tenets and historical moments of the body politic analogy, see David G. Hale, 'Analogy of the Body Politic' ['Analogy'], in Philip P. Weiner (ed.), *Dictionary of the History of Ideas* (New York: Scribner's, 1973–4), i. 67–70. For uses of the body politic analogy in Renaissance medicine, see Josep Lluís Barona, 'The Body Republic: Social Order and Human Body in Renaissance Medical Thought', *History and Philosophy of the Life Sciences*, 15 (1993), 165–80. It would be fruitful to pursue an investigation into the historical and conceptual relation between Cavendish's philosophy and Renaissance thought in general.

and friendship (rather than in war) to a healthy body,[27] and in the *Politics*, not only does Aristotle liken the state to a living body, but he follows through with the hierarchical implications of this: 'the state is by nature clearly prior to the family and to the individual, since the whole is of necessity prior to the part; for example, if the whole body be destroyed, there would be no foot or hand'.[28] Here is one example that shows Cavendish's use of the analogy: 'the truth is that a pure democracy is all body and no head, and an absolute monarchy is all head and no body, whereas aristocracy is both head and body, it is a select and proportional number for a good government, which number being united, represents and acts as one man' (*ODS* 276; cf. *NBW* 18).[29] Otto Mayr argues that the Renaissance saw the rise of the 'clockwork state' metaphor to join the analogy of the body politic. Whatever sense one makes of it, Hobbes himself seems to draw a parallel between the natural living body and the commonwealth by likening both to a clock or other such human-made (non-natural) mechanisms in both *De cive* (*EW*, vol. ii, p. xiv) and the *Leviathan* (*EW*, vol. iii, p. ix).[30] Cavendish, however, remains firmly committed to the body politic analogy, believing that both political and material bodies have the capacity to be natural, well-functioning wholes on the model of living organic

[27] Plato, *Laws* 628c ff., in John M. Cooper and D. S. Hutchinson (eds.), *Plato: Complete Works* (Indianapolis: Hackett, 1997), 1318–1616, at 1323 ff.

[28] Aristotle, *Politics* 1253ª19–21, in Jonathan Barnes (ed.), *The Complete Works of Aristotle* (Princeton: Princeton University Press, 1984), ii. 1986–2129, at 1988.

[29] This passage is from Cavendish's *Orations of a Divers Sort*, in which she presents many competing opinions on various topics. It is not, therefore, necessarily the case that she supports aristocracy. Rather, I cite this passage to show that she clearly conceives of political states on analogy with organic bodies.

[30] For competing interpretations of what Hobbes intends, methodologically, by these analogies, see J. W. N. Watkins, *Hobbes's System of Ideas: A Study in the Political Significance of Philosophical Theories* (New York: Barnes & Noble, 1965), chs. 3–4; M. M. Goldsmith, *Hobbes's Science of Politics* (New York: Columbia University Press, 1966), chs. 1 and 7; Tom Sorell, *Hobbes* (London: Routledge & Kegan Paul, 1986). Sorell argues against both Watkins and Goldsmith that Hobbes does not and cannot study both types of body—natural and civil—through parallel methods. Hobbes is not primarily interested, according to Sorell, in explaining how the (clockwork) body politic is functionally organized and dependent upon its parts; such a course of study is appropriate for physical bodies only, not political bodies (*Hobbes*, 16–19). For a discussion of the clockwork state metaphor, see Otto Mayr, *Authority, Liberty, and Automatic Machinery in Early Modern Europe* [*Authority and Liberty*] (Baltimore: Johns Hopkins University Press, 1986), ch. 4.

bodies.[31] (Political bodies, however, often end up in an artificial state when humans do not rightly recognize the proper relation among their parts (e.g. *PL* 47–8). The case of democracy is one clear example.)

While Cavendish does, I believe, make use of the body politic analogy, there are unique characteristics of her version of it.[32] First, her natural system is non-deterministic. Not only does she reject the clockwork metaphor with its implication of mechanical motion—externally imposed motion necessitating, through inviolable physical laws, specific movements—but she is also opposed to the idea of forcing natural individuals to consent to a natural, hierarchical social system. There may be a truth about the best social organization, just as there is a truth about the correct religious belief to hold, but liberty of conscience on such matters must be respected precisely because forcing 'consent' undermines our nature as rational, self-moving, and therefore free beings (e.g. *GNP* 248–9). We must freely consent to our social systems, even if it means we do not concede to the single best (and, for Cavendish, hierarchical) system. It is better to allow individual freedom and have an ill political body than to have a healthy state without individual freedom. In fact, she

[31] Georges Canguilhem remarks upon Descartes's 'Envisioning the body in terms of a clockwork mechanism' thereby replacing 'a political image of command and magical type of causality (involving words or signs) with a technological image of "control" ...' (Georges Canguilhem, *La Connaissance de la vie* (Paris: J. Vrin, 1992), 114). Cavendish is conversely compelled by the political image of the body, together (as we shall see in the concluding section of this chapter) with the form of causality Canguilhem associates with that image. The extraordinary ways in which Cavendish uses this political image is suggested in what follows.

[32] As Étienne Balibar notes with respect to Spinoza's use of the body politic analogy, 'This would seem to place Spinoza squarely in the line of Hobbes (the *Leviathan*) and, more generally, of a whole tradition which defines the State as an individual and which runs from the ancient Greeks to the present day. However, we must press this point further, since such an assimilation covers in reality a wide range of different views. The individuality of the State may be thought of as either metaphorical or real, and "natural" or "artificial", as a mechanistic or an organic solidarity, as a self-organising principle of the State or an effect of its supernatural finality' (Étienne Balibar, *Spinoza and Politics*, tr. Peter Snowdon (London: Verso, 1998), 64). Cavendish, too, is in this long tradition, and Balibar's urging that we pay heed to the exact details of a given thinker's use of the analogy is important in Cavendish's case no less than in others'. Locating Cavendish in this tradition, including relating her use of the body politic concept to her underlying metaphysical and physical commitments and to her guiding political concerns, is a large, and future, project for which the present sketch serves as a minimal preliminary.

believes that 'it is not impossible to conquer a world. ... but, for the most part, conquerors seldom enjoy their conquest, for they being more feared than loved, most commonly come to an untimely end' (*NBW* 71).[33]

Second, in drawing the parallel between state and living body, Cavendish sets up an interesting dialectic between the two. On the one hand, the hierarchy and predominantly orderly behaviour of organic bodies serve as a normative model for human societies. On the other hand, the freedom that humans have as social (rather than as natural) beings is extended to all of non-human nature as well. So while non-human nature is the normative starting point (e.g. *PPO* C2^{r-v}; *PL* 13), Cavendish seems to take human society as the physically explanatory starting point, making the elements of the state—human beings as social beings—the explanatory model for the elements of the living body. When writing about disease in organisms, she portrays the errors in blatantly sociopolitical terms. '... diseases are occasioned many several ways; for some are made by a home Rebellion, and others by forreign enemies, and some by natural and regular dissolutions, and their cures are as different; but the chief Magistrate or Governors of the animal body, which are the regular motions of the parts of the body, want most commonly the assistance of foreign Parts, which are Medicines, Diets, and the like' (*PL* 409; cf. *PPO* 307–8; *OEP* 81; *GNP* 157–8). But for Cavendish, this need not be—and nor do I think it is—a metaphor only. This is because all finite parts of nature have their own share of a specific form of sense, reason, and self-motion. Consequently, freedom belongs to all finite parts of the natural world. So all parts may freely disobey the prescribed good of the societies in which they find themselves, be they human societies or the society of the body.

Third, while Cavendish may not be explicit about this, the body politic analogy must apply to all finite individuals. It is not just the politic state and the living (human) body that are drawn into the analogy, but every and all finite beings must be as well. Once again, this

[33] See Hale, 'Analogy', Mayr, *Authority and Liberty*, and John Rogers, *The Matter of Revolution: Science, Poetry, and Politics in the Age of Milton* [*Matter*] (Ithaca, NY: Cornell University Press, 1996), chs. 1 and 6, for discussion of the authoritarian character of both the body politic analogy and the mechanical, clockwork metaphor. See especially Rogers for Cavendish's break from this tradition.

follows from the fact that every finite individual is sensing, knowing, self-moving—indeed, alive, according to Cavendish (e.g. *OEP* 38–9). Moreover, all finite individuals remain unified as individuals because of the special sympathy and love or desire that the parts feel for others within the unified body (e.g. *PPO* 75; *PL* 167), and because of the fact that each part thus contributes to the well-working of the whole. Every individual system continues to survive and endure as long as its parts function towards the persistence of the individual. Every finite individual being is analogous to a living body or a commonwealth in this way.[34]

These unique characteristics of Cavendish's use of the body politic idea may enable one to extract a theory of non-atomistic *matter* from Cavendish's normative argument regarding atomism. The argument for this conclusion goes beyond anything we actually find in Cavendish's work, though various elements of this argument are explicit in her work, and it also coheres with her broad philosophy of nature. So I present this as a Cavendishian proposal. In social systems, humans are not atomistic individuals but are functionally related to one another in a specific way for the well-running (health) of the society. When we behave as if we were atomistic, social disorder ensues. This is democracy's failing. Similarly, within nature, finite individuals, no matter how small, are not atomistic, and when they behave as if they were, disorder (disease in organisms, disintegration of other finite wholes) ensues. But this conclusion turns on finite bits of matter—visible and subvisible—belonging to normatively bound communities. Ultimately, all individuals must belong to a single, normatively bound community that is all of nature, for only this can explain the overall order of the natural world. And one might argue that *this* can obtain only on a theory of material plenism. How so?

The normative argument depends upon nature as a whole prescribing appropriate behaviour to its parts, but these standards of behaviour

[34] The normative portrayal of atomistic individuals presented here is not, of course, unique to Cavendish. It has become especially prevalent among current-day communitarians intent on exposing both the inaccurate conception of the individual supposedly put forth by liberalism and the danger posed to the thriving of communities by individuals attempting to behave as such beings by, for example, pursuing individual rights to the exclusion of recognition of social groups. See, for example, Charles Taylor, 'Atomism', in Alkis Kontos (ed.), *Powers, Possessions and Freedom* (Toronto: University of Toronto Press, 1979), 39–62.

come from nature's infinite wisdom, and its wisdom comes from its being materially infinite. Since all matter is rational, an infinite quantity of matter has infinite reason (*GNP* 11). But if finite material atoms that are distinct and separate from one another are all that exist in nature—if atomism as a theory of matter were true—then there would be no possible way for overarching standards and norms to obtain for two reasons. First, there would be no infinitely extended matter with its infinite aggregated wisdom to provide those norms. Material atoms, as finite portions of matter, would have a merely finite share of reason. This leads to one of the main problems with material atoms for Cavendish. Because there is no aggregated, infinite wisdom in finite atoms, there can be no single, universal standard of behaviour. Each atom would therefore have to prescribe its own norms to itself—each would be like a deity in this way, with an 'absolute power and knowledge' (*OEP* 129). Second, in lieu of an infinitely aggregated material wisdom, one might suggest an immaterial substance existing apart from nature as the source of overarching order. But this is precluded too. A contrast with Leibniz is useful here, for he believes in the existence of immaterial atomistic beings which nonetheless behave harmoniously among each other only because God establishes harmony.[35] But since Cavendish rejects a role for God in natural explanations (e.g. *PL* 201–11), that potential source of universal standards is precluded too. But, once again, Cavendish believes there *are* such standards, independent of human convention. Our ability meaningfully to condemn certain actions as disorderly presupposes standards that, on Cavendish's theory of matter, require a non-atomistic infinite plenum of infinitely rational wise matter as the only possible source of those standards.

This new interpretation of the normative argument regarding atomism vindicates the first premiss of that argument. In challenging the truth of that premiss, one asks why Cavendish believes that any form of atomism, even one in which atoms have reason, would result in disorder while a theory of rational matter in a plenum would not result in disorder. There are really two parts to this problem. First, why would rational atoms result in disorder? One could answer this

[35] For an account of the differences between Cavendish and Leibniz (as well as their similarities), see Wilson, 'Two Opponents'.

by saying that should it be established that the world is comprised of only atoms, each of which is like a deity unto itself with absolute power, including the power to set its own norms given that there is nothing else besides individual atoms dictating norms, then not even atoms with reason (as opposed to irrational, chance-governed atoms) could lead to orderly behaviour. This is because each atom would be setting its own distinct standard of behaviour and acting accordingly. And, moreover, we see exactly this case arising in our world when individual parts within the whole of nature act as if they can rightly set their own standards and norms of behaviour distinct from those of nature as a whole. That is, individuals that, as a matter of fact, behave as if they were atoms prove, by example, the disorder that would follow from atomism as a thoroughgoing account of matter.[36] The second part to the question asks why a plenist account of matter would *not* give rise to disorder, and there are two ways of answering this question. One answer has it that a plenist theory of matter implies that nature as a whole has infinite rationality and wisdom. So infinite nature acts as a principal, morally efficacious cause encouraging, by rational persuasion, its parts to behave in an orderly fashion, thus giving rise to greater order. A second way of answering this is simply to challenge Cavendish on this claim that a material plenum results in thoroughgoing order because she herself leaves room for disorder, even on her own matter theory. This, of course, is Cavendish's denial of the second premiss dealt with in the previous section in such a way as to allow for the anti-atomism of the plenist view of matter. That plenist conception of matter is decisively established by the logico-mathematical argument and might well follow from the normative argument in the manner just presented.

6. MONISM AND CAUSATION

As far as her conception of nature is concerned, Cavendish is a monist. Depending upon precisely what this means, she might also be read

[36] Strictly speaking, if thoroughgoing atomism were true, there would not be any disharmony because there would be no single norm setting standards of right and good against which behaviour could be measured to determine how orderly (or not) it is.

as espousing a broadly Spinozistic conception of the natural world.[37] Indeed, as I shall soon show, there is significant textual evidence to tempt one to this conclusion. It would be incorrect, however, to read Cavendish as holding an especially robust (Spinozistic) form of monism, for this would undermine a central plank of her metaphysics, her theory of occasional causation. In order to ease the tension between her monism and her theory of causation, we must turn to the lessons of her normative argument against atomism to understand the limits of her monism. In the process, we see Cavendish's unique position in the history of seventeenth-century conceptions of nature.

There are two compatible ways one might conceive of Cavendish's monism. First, it might amount to the belief that there is one type of matter. I call this 'type monism', and Cavendish is certainly a type monist. While it is true that there are three aspects of matter—inanimate, sensitive animate, and rational animate—every possible piece of matter is comprised of all three aspects. This is because of her theory of complete blending (or inseparable commixture) according to which infinitely divisible matter will always include each of the three aspects of matter, regardless of how small the piece of matter becomes. Indeed, the infinite divisibility of matter is what permits the *complete* blending of all aspects of matter. Thus, 'although I make a distinction betwixt

[37] In an unpublished paper ('The Vitalist Natural Philosophies of Margaret Cavendish and Henry More'), Leni Robinson correctly points out that, strictly speaking, Cavendish is not a monist because she allows for the existence of both nature and God. There are two aspects to Robinson's position that must be heeded. First, Cavendish's philosophy is one of 'radical dualism of matter and spirit', or of nature (the material) and God (the immaterial). I fully grant this, and so specify that my claims about her monism are claims about her theory of nature considered in and of itself. This first point alerts us to an essential difference between Cavendish and Spinoza—her, but not his, acknowledgement of a transcendent God (see n. 6 above). The fact that Cavendish claims to fully sideline God in a discussion of the natural world which is (like Spinoza's nature) infinitely extended, and both material and perceptive, lends some legitimacy to the likening of their treatments of nature. But, and this is the second and most crucial aspect of Robinson's claim, Cavendish occasionally slips into a more thoroughgoing monism 'where Cavendish adopts ... the doctrines of a Neoplatonic cosmic system based on emanation'. Robinson is also right about this, and it would be an interesting project to investigate Cavendish's suggestion that God creates by emanation, and to pursue the impact of this suggestion upon her conception of nature, individuals, and laws. When I speak of Cavendish's monism in this chapter, I refer solely to the natural world, acknowledging the less than strict usage to which I put the term. My gratitude to Paul Guyer for his very helpful line of questioning during a presentation of this chapter in early form which led to my closer consideration of Cavendish's monism.

animate and inanimate, rational and sensitive matter, yet I do not say that they are three distinct and several matters; for as they do make but one body of nature, so they are also but one matter' (*OEP* 206; cf. 23–4). Every part of matter has motive, sensing, and reasoning capacities, and is also limited in its ability to move by inanimate matter. This is the single *type* of matter that exists.

Second, Cavendish's monism might amount to the belief that there is just one token: there is one single whole—all of nature—with parts within it being merely specific figures within the whole. I call this 'token monism'. An especially robust form of token monism would include claims about both substance and cause. Taken as a thesis about substance, (Ai) it would maintain that there is only one substantial individual—namely all of nature itself—which is the only whole, albeit with many parts. This contrasts with (Bi) the belief that there are multiple substantial individuals within nature, such that nature is simply a collection of wholes. Taken as a thesis about cause, (Aii) token monism depends upon top-down causal determinism with the whole of nature acting as the principal cause for all effects, parts within nature being mere effects, and nature as a whole determining the character of the parts. This contrasts with (Bii) a bottom-up conception of causal relations according to which multiple natural individuals (wholes within nature) act as principal causes in their interactions with each other, and these interactions determine the nature of the whole. Taken together, (Ai) and (Aii) would seem to necessitate specific and inviolable interrelations among the parts of nature. Cavendish never carves up the conceptual terrain this carefully, but it is helpful to do so in order to see the precise nature of her monism.

There is much textual evidence in favour of token monism even in the very strong form presented here. Here is a passage that supports token monism as a thesis about substance (Ai): 'I conceive nature to be an infinite body, bulk or magnitude, which by its own self-motion, is divided into infinite parts; not single or indivisible parts, but parts of one continued body, only discernible from each other by their proper figures, caused by the changes of particular motions ...' (*OEP* 126; cf. 47–8; *PL* 26). The following passage also supports (Ai) and the implication that necessary and specific relations hold among the parts of the one, single whole that is all of nature:

the Infinite whole is Infinite in substance or bulk, but the parts are Infinite in number, and not in bulk, for each part is circumscribed, and finite in its exterior figure and substance. But mistake me not, when I speak of circumscribed and finite single parts, for I do not mean, that each part doth subsist single and by it self, there being no such thing as an absolute single part in Nature, but Infinite Matter being by self-motion divided into an infinite number of parts, all these parts have *so near a relation to each other*, and to the infinite whole, that one cannot subsist without the other; for the Infinite parts in number do make the Infinite whole, and the Infinite whole consists in the Infinite number of parts. (*PL* 157–8; my emphasis; cf. *PL* 243)

The following two passages suggest that nature as whole, but no part within nature, acts as cause (Aii):

Neither do natural bodies know many prime causes and beginnings, 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; and all the variety and difference of natural Creatures arises from her various actions, which are the various motions in Nature. (*PL* 238)

... I do not intend to make particular creatures or figures, the principle of all the infinite effects of nature, as some other philosophers do; for there is no such thing as a prime or principal figure of nature, all being but effects of one cause. (*OEP* 17–18; cf. *PPO* 8; *OEP* 16, 141)

There is also conceptual evidence that suggests token monism best captures Cavendish's philosophy of the natural world, specifically her arguments against atomism. The logico-mathematical argument against atomism encourages the theory of type monism because of the fact of the unending divisibility of matter coupled with Cavendish's theory of complete mixing. Moreover, one might argue that the unlimited divisibility of matter's parts 'all the way down' finds a similar infinite composition of matter's parts 'all the way up'. This leads to token monism taken as a theory of substance (Ai) because what appear to be distinct individuals are really just parts of larger and larger parts, and so on ad infinitum. There is only one substantial whole: all of infinite nature itself; all of matter makes 'but one body of nature' (*OEP* 206). Cavendish's normative argument against atomism might suggest that she accepts token monism as a theory of cause (Aii). Since we cannot accept the supposition that finite individuals 'have an absolute power and knowledge' (*OEP* 129)—since we cannot accept

atomism—it is perhaps not unreasonable to interpret her rejection of atoms' absolute power as a rejection of whole individuals acting as principal causes of natural effects (Bii).

But problems arise for the theory of token monism with a consideration of Cavendish's theory of occasional causation.[38] It is crucial here to make a distinction between occasional causation and occasionalism, since the latter posits the utter impotence of the natural world and God's will as the sole efficacious cause in that world, and Cavendish denies both premisses. This follows from her insistence that we eliminate theology and appeals to God from our natural investigations (*PL* 201–11). As Steven Nadler shows, occasional causation is a more general theory than occasionalism and does not specify God as the principal source of causal change.

> In simple terms, a relationship of occasional causation exists when one thing or state of affairs brings about an effect by inducing (but *not* through efficient causation ...) another thing to exercise its own efficient causal power. ... Thus, the term 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 especially) to the effect, *e*, produced by *B*.[39]

Cavendish's theory of causation is a theory of occasional causation in this more general sense.

In her *Letters*, Cavendish explains to her fictional interlocutor that her own theory of causation, and not, for example, a theory based on the transfer of motion from one body to another, is the appropriate way to understand many (though not all) instances of causal interaction.[40]

[38] For an outstanding account of Cavendish's theory of causation and its historical context, see O'Neill, 'Introduction', pp. xxix–xxxv. I deal much more extensively with Cavendish's theory of occasional causation and its relation to freedom and natural disorders in my 'Reason and Freedom'.

[39] Steven Nadler, 'Descartes and Occasional Causation', *British Journal of the History of Philosophy*, 2/1 (1994), 39.

[40] Susan James deals with other forms of causal interaction in Cavendish's work, noting specifically the contrast between alteration (often accomplished by occasional causation) and generation (accomplished by transfer of inherently motive matter, and thus never by occasional causation) (James, 'Innovations'). O'Neill also stresses that Cavendish allows for transeunt causation (which is distinct from occasional causation) in, for example, respiration ('Introduction', p. xxxv).

> *Madam*, give me leave to ask you this question, whether it be the motion of the hand, or the Instrument, or both, that print or carve such or such a body? Perchance you will say, that the motion of the hand moves the Instrument, and the Instrument moves the Wood which is to be carved. ... But I pray, *Madam*, consider rationally, that though the Artificer or Workman be the occasion of the motions of the carved body, yet the motions of the body that is carved, are they which put themselves into such or such a figure, or give themselves such or such a print as the Artificer intended; for a Watch, although the Artist or Watch-maker be the occasional cause that the Watch moves in such or such an artificial figure, as the figure of a Watch, yet it is the Watches own motion by which it moves. (PL 77–9)

In another example, when a body falls upon the snow, it is not the body that leaves its impression behind in the snow, but rather, 'the snow ... patterns the figure of the body. ... [It] patterns or copies it out in its own substance, just as the sensitive motions in the eye do pattern out the figure of an object' that it sees or perceives (*PL* 104–5). To 'pattern out' means to frame figures 'according to the patterns of exterior objects' (*OEP* 169), and most often in her writings, Cavendish seems to mean this very literally. The physical figure of the body falling upon the snow is physically printed out into the snow's matter from within the snow itself; bodies 'put themselves into such or such a figure' as the occasional cause intended (*PL* 79; cf. 539–40). While the precise mechanism of the interaction between occasional and principal cause is never fully specified, the ubiquitous rationality of matter is essential to this interaction. The occasional cause rationally suggests a course of actions that the principal cause may then rationally respond to by patterning out an appropriate figure.

So, according to Cavendish, in changes brought about by occasional causation, there is an occasional cause—the body eliciting the effect in another body—and there is a principal cause—the affected body itself bringing forth from within itself (patterning out) the appropriate effect. Cavendish has a number of motivations for believing that at least some causal interactions occur through occasional causation. One of these is her belief that motion, as a mode, cannot transfer from body to body, and so the motion of the affected body must come from within the affected body itself (*PL* 77–8, 445; *OEP* 200). Another motivation stems from Cavendish's recognition that we often err in our sense perception, and occasional causation

can explain such errors. Erroneous perceptions (*PPO* 66–7)—for example, hallucinations when the subject perceives an object as present when it is not—cannot have come about owing to the influence of an immediately present external stimulus; they must have been brought forth from within the subject of perception herself. An external cause is thus unnecessary: 'the Object is not the *cause* of Perception, but is only the *occasion*: for, the Sensitive Organs can make such like figurative actions, were there no Object present; which proves, that the Object is not the Cause of the Perception' (*GNP* 56). Similarly, the fact that we may not feel a pinch when distracted by intense thought, establishes that there can be no direct causal connection between the object of perception (which is clearly not sufficient) and the perception itself (*OEP* 150). The principal cause may or may not respond to the rational suggestion of the occasional cause.[41]

Occasional causation undermines token monism since, under occasional causation, individual bodies within nature act as principal causes and are not mere effects (Bii). In principle, as the examples of perceptual errors just cited show, the occasion is neither necessary nor sufficient for the principal cause to act, thus allowing natural individuals as principal causes a significant degree of independence from other natural individuals, a degree of independence that goes beyond what would be tolerated by token monism taken in an especially robust sense as a theory both about substance and about cause.[42] So it seems that Cavendish is in a bind. There is textual evidence suggesting she endorses token monism, taken as a theory about both cause and substance. There is also conceptual evidence for token monism taking the form of her arguments against atomism. On the other hand, however, occasional causation, which seems as central to her metaphysical system as

[41] Dreams are a special and interesting case for Cavendish, as she herself notes (*PPO* 67, 280 ff.). I shall not deal with this case here. Of course, there are alternative ways of explaining such perceptual phenomena, including by appeal to mechanical explanations such as Hobbes's of which Cavendish was aware, having read *Leviathan* (*EW* iii. 3 ff.). Her explanation through occasional causation for these perceptual phenomena is another possibility, and she has independent reasons for favouring her approach, mainly that mechanical causal interaction on the model of motion transferring from body to body cannot happen given that motion as a mode *cannot* transfer from body to body.

[42] O'Neill draws our attention to this notable degree of independence when she notes that: '... (1) the occasion has no intrinsic connection with the effect; (2) it is not necessary for the production of the effect ... (3) it has no direct influence on the production of the effect ...' ('Introduction', p. xxx).

does her monism, includes an endorsement of finite individuals acting as principal causes which subverts token monism taken as a theory about cause. She cannot, it seems, retain both token monism and anti-atomism on the one hand, and occasional causation on the other hand. To solve this impasse, we must now draw upon the lessons learned from reinterpreting her normative theory of atomism.

Cavendish links her theory of occasional causation with freedom: 'the action of self-figuring [patterning] is free' (*PL* 24; cf. 18). This is not surprising because 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. There are different degrees of freedom within natural actions. Some natural events are dubbed 'voluntary' while others are 'occasioned'. Voluntary actions, understood in this new way, are actions that are not dependent upon or constrained by an occasional cause encouraging the principal cause to act in a specific manner. The principal cause acts entirely on its own; these voluntary actions are called actions 'by rote' (*OEP* 19–20); and they are freer than occasioned events. 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.[43] Memories and dreams are examples of perceptions that fit into the class of rote actions (*OEP* 33, 97, 272; *PPO* 280). A hand tossing a bowl is an example of an occasioned action (*PL* 445).

Actions that are constrained by an occasional cause are more regular and less prone to disorder (*OEP* 33), even if they are less free than

[43] O'Neill also (see n. 42) draws our attention to the notable degree of interdependence between occasional and principal cause when she notes that '... (4) an occasion has an indirect influence on the production of the effect by inducing the primary cause to act, and (5) insofar as it exerts this sort of influence, it counts as a partial efficient *moral* cause of the effect ...' ('Introduction', p. xxx).

are rote actions. Radically free individual parts in nature—parts that are constrained by nothing, not even the rational persuasion of an occasional cause—tend to non-orderly behaviour. Above I noted that the fact of erroneous perceptions is one motivation for Cavendish's theory of occasional causation. One might wish to argue that we need not take such perceptions as erroneous at all, but rather that they merely appear so from our finite point of view. This line of reasoning would continue to the conclusion that there is, in fact, no occasional causation at all. Rather (according to this line of argument) nature as a whole causally determines from the top down (Aii) that precise and specific relations hold between so-called occasional and principal 'causes', causes which are, strictly speaking, just effects of the one true cause, namely, all of nature. Thus (the argument continues) all experienced relations among finite parts hold necessarily (including so-called 'errors' of perception), even if not directly but rather indirectly (with nature as a whole mediating those relations). This interpretation could then be used to resolve the tension in Cavendish between her monism and anti-atomism on the one hand, and her supposed adherence to occasional causation on the other hand, by simply denying that there is room for the theory of occasional causation in her philosophy. There are two facts taken together that tell against this interpretation of Cavendish. First, nature as a whole is infinitely wise. 'Nature having Infinite parts of Infinite degrees, must also have an Infinite natural wisdom to order her natural Infinite parts and actions...' (*PL* 8–9; cf. 144, 161; *OEP* 121, 138, 214). Second, there are true natural errors (and not just events that we interpret as errors), be these perceptual errors or civil wars or disease. If a strict form of token monism were true, and infinitely wise nature were to causally determine relations among its parts to be harmonious and orderly, then there would be no natural disorders because nature's wisdom would necessitate order. But there *are* true disorders. The fact that Cavendish takes some natural events to be objectively bad because they are opposed to the wise order of nature, and not just subjectively so from a finite human point of view, indicates that infinitely wise nature *cannot* be acting as the single, principal, ordering cause. If it were, it would not permit such deviations.

I have shown already the connection between Cavendish's anti-atomism and her embrace of both type and token monism. There

is also, we can now see, a connection—though a much looser one—between her theory of occasional causation and atomism, for both are identified as the source of natural disorders. Finite individuals within nature, when they act as principal causes, can act as renegade bodies independently from all others, just as she envisions atoms would do if they existed. So we see the parallel between, on the one hand, Stevenson's belief that Cavendish cannot give up atomism although she wants to do so, and, on the other hand, the tension between monism and occasional causation. Monism and anti-atomism are compatible, and both seem to imply natural order. And occasional causation and atomism are compatible, and both imply disorder.

This parallel between Stevenson's concerns and the tension between monism and occasional causation allows us to solve that latter tension precisely by turning to the solution proposed to Stevenson's concern. Recall that token monism can be taken as a theory either about substance or about cause. As a theory about cause, it states that nature is sole principal cause and that finite parts within nature are mere effects of that cause. But, as we learned from the Hobbes–Bramhall debate adjusted to suit Cavendish's theory of nature, nature as a whole might act as principal moral or natural (physical) cause. An especially strong form of token monism would say that nature acts as both sorts of cause. Must Cavendish be forced to this conclusion, especially given the texts cited above in favour of token monism taken as a theory about cause?

I believe not, and to show this, we need to deny that nature is principal cause in a natural, physical sense. To do this, we need to reinterpret the passages that urge token monism taken as a theory about cause (Aii). Here they are again:

> Neither do natural bodies know many prime causes and beginnings, 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; and all the variety and difference of natural Creatures arises from her various actions, which are the various motions in Nature. (*PL* 238)

> ... I do not intend to make particular creatures or figures, the principle of all the infinite effects of nature, as some other philosophers do; for there is no such thing as a prime or principal figure of nature, all being but effects of

one cause. But my ground is sense and reason, that is, I make self-moving matter, which is sensitive and rational, the only cause and principle of all natural effects. (*OEP* 17–18).

Rather than read these passages as endorsing the view that there is a single substantial cause (namely, all of nature taken as the single principal cause), we could as easily read these passages as endorsing the view that there is a single type of cause (namely, rational and sensitive matter). All effects we experience in the world come about as the result of self-moving matter (rather than, for example, a finite or infinite incorporeal mind). But that does not mean that the effects we experience come about as the result of the one, single material whole. That is, these passages may be read as an endorsement of type, but not token, monism. This stills allows that nature as a whole acts as some sort of principal cause—specifically, as the principal moral cause, or the ultimate source of natural order. As the locus of infinite wisdom, nature imposes rational order from the top down, but it does so without necessitating that its parts abide by this order. This is because the parts within nature also act as principal causes, both as principal moral causes (giving reasons of their own to themselves) and as principal natural or physical causes (acting or not on those reasons). As principal causes, they can act differently from how they ought to act according to infinite nature's prescriptions.

While Cavendish never presents her theory of matter and cause exactly like this, it is a viable interpretation because it can best explain her belief in the freedom of nature's parts, with freedom defined as rational self-activity. There is some textual evidence, too, that this is her intention. In the *Grounds of Natural Philosophy* (hereafter *Grounds*), for example, she writes:

> To treat 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.* (*GNP* 15; my emphasis)

Until the last sentence, this passage supports strong token monism as a causal theory since finite creatures are taken as mere effects (Aii), but the last sentence allows for the parts to be causes themselves, thus

moving her monism (as a thesis about cause) to a weaker form that can accommodate some independent causal activity of finite creatures (Bii). Of course, as principal moral and natural causes, parts within the whole of infinite nature can freely choose to act within or outside of the confines suggested by nature as an infinite whole, and this explains both the variety we see within natural kinds as well as full-out perversions from natural kinds (e.g. *PL* 173–4, 238–9).[44]

As a theory of substance, Cavendish's token monism can be as robust as (Ai): there is only one substantial individual—namely all of nature itself—which is the only whole, albeit with many parts. Indeed, the logical anti-atomism argument, together with the conceptual impossibility of empty space or a vacuum and Cavendish's theory of complete blending, necessitates this conclusion. But this does not result in specific inviolable relations among finite parts holding with necessity; these relations may be merely contingent. This is permitted by the weakening of monism as a causal theory. Precisely because natural individuals can act as free principal causes determining themselves, there are no specific and necessary relations among them, and so it is possible for natural parts to exhibit significant independence from one another. But this does not detract from the fact that individuals are nonetheless in some sort of relation with others, that they ought to recognize this fact of interdependence, and that they ought, therefore, to have specific and necessary relations with each other—namely, those that are normatively good because they are in line with the overall natural order. Indeed, when the parts gain greater unity, there is also greater recognition that there is one truth to be pursued, and this is due to the greater consolidation of wisdom; nature as a whole knows itself and its norms and standards with full clarity (*GNP* 11). While wholly harmonious unity is the ideal towards which parts ought to strive, even if the precise and specific normative relations among

[44] One might wonder where the line between normal and abnormal variety is drawn for Cavendish, and here the answer would likely be similar to her explanation for how we determine natural kinds. We make likely guesses as to the kinds that nature determines will exist from the infinite kinds that 'only matter' could produce, and we make these guesses owing to the figures and shapes we experience in the natural world. All our suppositions made about nature in this way are merely probable, never certain (*PL* 507; *OEP* 214). So too we would need to make likely guesses as to what forms of variety fall within the range of normal variety and what forms fall into the range of the 'monstrous' on the basis of the normal range of variety we experience in any given natural kind.

parts are attained, these would still be fully voluntary and therefore contingent in the sense that they could have been otherwise had the parts of nature freely chosen otherwise.

Cavendish's motivations for holding this form of monism are not entirely grounded in a conception of matter. This should be clear from her two arguments against atomism and their quite distinct primary conclusions. It is true that her rejection of a vacuum and her acceptance of the divisibility of whatever has quantity (implying the infinite divisibility of matter) give her good metaphysical reasons for endorsing monism. But her beliefs that there are norms, standards, and harmony in nature, that individuals (both humans and non-humans) are free, and that this freedom permits dissent from norms, thus leading to disorders, are not beliefs grounded in claims about the nature of matter, motion, and vacua. These are decidedly value-laden claims, and they reflect Cavendish's broader interests and concerns with her society. As a royalist in exile for a decade and a half, and as an opponent of democratically organized political states for the lack of harmony they would breed (*NBW* 95), Cavendish had sociopolitical reasons for taking seriously the capacity of free, rational individuals to disrupt hierarchically imposed order in order to produce disorder and suffering in its stead. What is remarkable about her philosophy is that she extends this depiction of the capacities of human individuals to absolutely all finite natural beings because they are all, in some way, rational. She works her social concerns into the very fabric of her metaphysics of matter.

This affords her a unique place in seventeenth-century natural philosophy. Like Spinoza, she is a substance monist in so far as the natural world is concerned, and, also like Spinoza, she believes that natural substance is infinitely extended and thoroughly perceptive. But, unlike Spinoza, the details of her monism do not lead to a necessitarian conception of all natural beings, including humans. The widespread order we witness in the natural world comes from the freely granted, rational obedience that finite beings give to the rational suggestion of other finite beings. In concert with this explanation for nature's widespread harmony, the occasional disorders we witness in both non-human and human nature arise from the rationality of natural beings that freely dissent from rational command to behave in a specific way. Nature is therefore irreducibly teleological and

normative, quite unlike Spinoza's conception of nature. But while we may explain the metaphysics of the actions of non-human nature in terms of human actions in our social relations (they are, after all, of the same nature and thus bound by the same forms of interaction), non-human nature, with its superior order and harmony, serves as the normative model for humans in our social interactions. This has significant implications for how Cavendish believes we ought to conduct ourselves socially. But that is a story for another time.[45]

[45] I thank the audience at the University of Pennsylvania's colloquium series for questions and discussion on this chapter in its earliest form, and I am especially grateful to Steven Gross for his written comments. Likewise, the audience at the University of Toronto's Nature and Necessity Conference was extremely helpful, especially questions posed by or discussion with Donald Ainslie, Christia Mercer, Lisa Shapiro, Catherine Wilson (who has also been very generous in sharing her own, forthcoming, work on Cavendish), and Susan James (with whom I also enjoyed inspiring conversation in London). Thanks to Leni Robinson for allowing me to read her wonderful work on Cavendish and More, to Michael Ryan at the University of Pennsylvania's Van Pelt Library for so thoughtfully sending me literature on Cavendish, to Tan Kok Chor for comments on a later version of this chapter, to Anna Cremaldi for her exacting eye in proofreading the final version, and to an anonymous referee of this volume for useful feedback. For more general discussion of Cavendish and early modern women philosophers in general, and for providing a model to emulate in so many ways, I am grateful to Eileen O'Neill.