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A Vitalist Shoal in the Mechanist Tide: Art, Nature, and 17th-Century Science

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Abstract: This paper reconstructs Margaret Cavendish's theory of the metaphysics of artifacts. It situates her anti-mechanist account of artifactual production and the art-nature distinction against a background of Aristotelian, Scholastic, and mechanist theories. Within this broad context, it considers what Cavendish thinks artisans can actually do, grounding her terminological stipulation that there is no genuine generation in nature in a commitment to natural and artistic production as the mere rearrangement of bodies. Bodies themselves are identified, in a conceptually Ockhamist manner, with their figures, so that the resulting theory of mere rearrangement is Scholastically respectable. The paper also offers literal interpretations, focused narrowly on the philosophical content of her theories of art and artifacts, of her claims that art concerns only "nature's sporting or playing actions", that its products are "deformed and defective", and that they are "at best . . . mixt or hermaphroditical."

Keywords: Margaret Cavendish; artifacts; art-nature distinction; mereology; vitalism; sympathy

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1. Introduction

This paper reconstructs Margaret Cavendish's theory of the metaphysics of artifacts. The reconstruction is interesting for at least two reasons. First, received accounts of the mechanization of philosophy in the early modern period emphasize the erosion of the Aristotelian and Scholastic art-nature distinction, and in particular the distinction between artifacts and natural bodies.[1] But erosion is a gradual process,[2] and the vitalist Cavendish resists the tide of mechanism in an interesting way.[3] Second, while Cavendish is usually slotted into debates among canonical early modern figures,[4] her theory of artifacts can be interestingly illuminated by reading her through Scholastic conceptual schemes.[5] Scholarly understandings of Descartes, Hobbes, and Spinoza have been advanced by placing them in the context of late Scholasticism.[6] Scholarly understanding of Cavendish, too, stands to benefit from the late Scholastic frame, even as Cavendish's lack of a formal education and professed monolingualism complicates questions of direct engagement.[7]

In the course of reconstructing her theory, several puzzling claims are illuminated. Cavendish denies that artists "make the materials" with which they work ([25], Part 2, ch. 21, p. 241). This explicit rejection of an Aristotelian claim is understood to resonate both with her anti-mechanism in general, and with her anti-mechanistic conception of artistic production in particular. She further stipulates that there is no genuine "Generation" but only "Transformation" in nature ([26], Part 1, Letter 21, 71). That terminological stipulation is justified via an appeal to (both artistic and natural) production as mere rearrangement. Her justification is framed here as Scholastically respectable, and in particular as justification by Buridanian lights on conceptually Ockhamist grounds, in senses explained below. The interpretation draws on a reading of Cavendish's repeated claims that figure and body are "but one thing" as having to do with numerical identity.[8] Finally, she claims that art concerns only "nature's sporting or playing actions" ([25], Part 1, ch. 26, p. 105); that its products are "deformed and defective" ([25], Part 1, ch. 3, p. 53); and that they are "at best . . . mixt or hermaphroditical" ([25], Part 1, ch. 3, p. 53). Each of these apparently metaphorical claims receives a fairly literal, and narrowly philosophical, interpretation below.[9]

The reconstructed theory is deeply vitalist. It incorporates an anti-mechanist and non-Scholastic rewriting of the art-nature distinction, builds on Cavendish's rejection of central features of the epistemology of 17th century mechanistic science, and culminates in a "passionate love"- or "sympathy"-based theory of artifactual unity. It does all this while remaining, in important ways, Scholastically respectable. Appreciating the clarity and understanding with which Cavendish formulated this theory is thus an important step towards appreciating the systematicity and overall coherence of her metaphysics, rather than reducing it to a flowery pastiche of contemporary theories.[10]

2. Cavendish against Mechanists on the Art-Nature Distinction

The Scholastic art-nature distinction emerged from a distinction in Aristotle between things that exist "by nature" (*phusei*) and have their principle of motion within themselves, on the one hand, and things that have their principle of motion outside of themselves, on the other.

> Of things that exist, some exist by nature, some from other causes. By nature the animals and their parts exist, and the plants and the simple bodies (earth, fire, air, water)—for we say that these and the like exist by nature.
>
> All the things mentioned plainly differ from things which are *not* constituted by nature. For each of them has within itself a principle of motion and of stationariness (in respect of place, or of growth and decrease, or by way of alteration). On the other hand, a bed and a coat and anything else of that sort, qua receiving these designations—i.e., in so far as they are products of art—have no innate impulse to change. (*Physics*, Book II, ch. 1, 192b9-20; [32], vol. 1, p. 329)

Aristotle's examples of things that have their principle of motion outside of themselves—a bed and a coat—are stereotypical artifacts. That is, they are the kinds of things produced by artisans. He contrasts such artifacts with natural things, like animals, plants, and the elements.

Without going into further details of Aristotle's distinction or Scholastic theories of artifacts, it will suffice for present purposes to note two features of how mechanism collapses this art-nature distinction. First, insofar as the distinction tracks whether things have an internal principle of motion, mechanists stereotypically place everything on the art side of that distinction by denying that anything can have an internal principle of motion.[11] Second, mechanists stereotypically understand God as the artisan or craftsman who produced nature.[12] If all of nature is a divinely crafted artifact, human artisans must be doing something different only in degree rather than in kind.[13] The artisan thus conceived is an *artifex* in the image of God, the *artifex maximus*.[14]

The vitalist Cavendish rejects both of these features. First, everything in her metaphysics has an internal principle of motion: Animate matter, which in her mature works she identifies with self-motion, is a constitutive principle of nature, found in every part thereof.[15] Particular productions of nature are attributed to animate matter as the "chief Architect of all Creatures" ([26], Part 3, Letter 18, p. 306). Elsewhere she refers to "self-motion, the architect and creator of all figures" ([25], Part 1, ch. 5, p. 55). Thus, in a passage rejecting the view, explicitly attributed to Aristotle, that "whatsoever is moved, must necessarily be moved by another," she asserts that "every part and particle of nature, has the principle of motion within itself, as consisting all of a composition of animate or self-moving-matter" ([25], Part 3, ch. 5, p. 269).[16] The commitment to animate matter as a universal cause is a deeper feature of her metaphysics than can fully be exposed here.[17] But it should be clear that, insofar as the art-nature distinction tracks whether things have an internal principle of motion, Cavendish places everything on the nature side of the distinction: Animate matter is just as responsible for microscopes and houses as it is for heliotropes and horses. At least with respect to what caused them, artifacts and natural creatures are thus on a par. So despite Cavendish's consistent, deep opposition to mechanism, she joins her mechanist contemporaries in rewriting the art-nature distinction.[18]

Second, she does not think of God as having done something different only in degree from what human artisans do. God is the "Creator" of "Nature, the Effect and Creature of God", but not its craftsman ([26], Part 1, Letter 3, pp. 16–17). Cavendish understands the creative act as an exclusively divine prerogative.

> the work of creation and annihilation, is a divine action, and belongs only to God ([25], Part 2, ch. 8, 212)

> As for nature, she being eternal and infinite, is not subject to new generations and annihilations in her particulars ([25], Part 3, ch. 2, para. 8, 255)

Thus, far from regarding the artisan as an *artifex* in the image of God, neither particular artisans nor even infinite nature itself is capable of genuinely creating or generating anything.

> it is manifest that I am not of the opinion of that experimental writer who thinks it no improbability, to say, that all natural effects may be called artificial, nay, that nature herself may be called the "art of God"[19] ([25], Part 2, ch. 2, p. 198)

As we will see below, this is not merely a terminological stipulation. Cavendish's insistence that generation is a divine prerogative is backed up by at least two commitments that can be made clear by comparison with Scholastic metaphysical views: a conceptually Ockhamist understanding of (at least artificial) productions as rearrangements, and a conceptually Ockhamist commitment to the numerical identity of figure and figured bodies. (The "conceptually Ockhamist" label will be justified in Section 4, and the parenthetical restriction to "(at least artificial)" productions will be illuminated in Section 5).

Given Cavendish's rejection of mechanist grounds for collapsing the art-nature distinction, it is perhaps no surprise that she reproduces a vitalist version of the distinction, if one that resides entirely on the nature side of the divide. That is, she distinguishes between natural creatures as first-rate productions of nature, on the one hand, and artifacts as inferior productions:

> as much as a natural man differs from an artificial statue or picture of a man, so much differs a natural effect from an artificial, which can neither be so good, nor so lasting as a natural one. If Charles' Wain, the axes of the earth, and the motions of the planets, were like the pole, or axes, or wheels of a coach, they would soon be out of order. Indeed, artificial things are pretty toys to employ idle time: Nay, some are very useful for our conveniency; but yet they are but nature's bastards or changelings, if I may so call them: and though nature takes so much delight in variety, that she is pleased with them, yet they are not to be compared to her wise and fundamental actions…her artificial works, are her works of delight, pleasure and pastime: Wherefore those that employ their time in artificial experiments, consider only nature's sporting or playing actions ([25], Part 1, ch. 26, p. 105)

While artifacts are thus inferior, they are still produced by nature, and in particular by their own animate matter, which is the internal vital principle of their own self-motion, as well as a constitutive part of nature as a whole.[20] Cavendish does not offer an explicit interpretation of what she means when she calls artificial things "toys" produced by "nature's sporting or playing actions", nor of the other metaphors for the inferiority of artifacts offered in this passage. It is clear from her texts that Cavendish connects nature's playing with human playing: for example, she dismisses experimental scientists as boys playing with toys.[21] But finding an interpretation of these metaphors in terms of more official categories of her metaphysics is part of the work of this paper. As a step towards that interpretation, it will help to see what it is that Cavendish thinks human artisans can actually do.

3. The Artisan's Skill and Knowledge

For Aristotle, the artisan has an ability to make things.

> … *art* is identical with a state of capacity to make, involving a true course of reasoning. All art is concerned with coming into being, i.e., with contriving and considering how something may come into being which is capable of either being

> or not being, and whose origin is in the maker and not in the thing made; for art is concerned neither with things that are, or come into being, by necessity, nor with things that do so in accordance with nature (since these have their origin in themselves). (*Nicomachean Ethics*, Book VI, ch. 4, 1140a9-15; [32], vol. 2, p. 1800)

Aristotle takes the "origin" (*arche*) of an artifact to be "in the maker" because he takes the efficient cause of an artifact's coming into being to be "the application of the [artisan's] expertise (*techne*)" ([48], p. 70, internal italics modified). But the previous section established that, for Cavendish, artifacts are made by nature, in the sense that they're made by animate matter, which is nature's principle of (self-)motion. So no Cavendishian artifact can have an "origin in the maker and not in the thing made" in the Aristotelian sense: her metaphysics does not appear to leave room for the application of an artisan's expertise to be the efficient cause of an artifact's coming into being.

It does, however, leave room for the artisan to occasion parts of nature to compose an artifact.[22]

> though art may be an occasion of the changes of some parts or motions, of their compositions and divisions, imitations, and the like; like as a painter takes a copy from an original, yet it cannot alter infinite nature; for a man may build or pull down a house, but yet he cannot make the materials, although he may fit or prepare them for his use: so artists may dissolve and compose several parts several ways, but yet they cannot make the matter of those parts; and therefore, although they may observe the effects, yet they cannot always give a true or probable reason why they are so, nor know the several particular causes which make them to be so ([25], Part 2, ch. 22, pp. 241–242)

I will refer to this passage below as *the artists passage*. The artists passage makes both positive and negative claims. On the positive side, it says that artisans "may dissolve and compose several parts several ways". The question of what the artisan does is thus really the question of what this "dissolv[ing] and compos[ing] several parts several ways" amounts to. As discussed in the previous section, it will not amount to generation, though as yet it remains to be seen that there is more to this claim than an unearned terminological stipulation. But before discussing this positive side of the artists passage, its negative side, Cavendish's emphasis on the artisan "not mak[ing] the materials", or not making the matter of the parts of nature that are composed in the production of an artifact, deserves an excursus.

There are at least four important points to make about the negative side of the artists passage. The first is that Cavendish thereby sets herself apart from orthodox Aristotelianism, for Aristotle claims that at least some "arts make their material (some simply make it, others make it serviceable)" (*Physics*, Book II, ch. 2, 194a34-35; [32], vol. 1, p. 332). In particular, artisans "make the material with a view to the function" of that material in the artifact that they aim to create (*Physics*, Book II, ch. 2, 194b7-8; [32], vol. 1, p. 332). Thus, for example, artisans have to make "bricks and beams" before a house can be made (*Physics*, Book II, ch. 2, 194a23-26; [32], vol. 1, p. 331).[23] Cavendish seems familiar with the Aristotelian distinction between "simply mak[ing]" material and merely "mak[ing] it serviceable". Rejecting the possibility of artisans making their materials *simpliciter* seems to be part of the import of her concession, in the artists passage, that although artisans "cannot make the materials", they "may fit or prepare them for [their] use". That is, she seems to be making exactly the Aristotelian distinction between simply making material and merely making material serviceable. Further, as we will see below in Section 5, there is some evidence for the view that Cavendish would deny that artisans make bricks and beams before making a house, that is, that she really means to deny that artisans can "simply make" materials.[24] Without placing too much weight on Cavendish having known Aristotle's position under that description, then, Cavendish's denial that artisans make their materials can be understood as a denial of precisely the Aristotelian claim.[25]

The second point concerns the immediate context of Cavendish's denial that artisans make the matter of parts of artifacts. That context is her rejection of the possibility of a

universal medicine, which she associates with Jan Baptist van Helmont, who claimed that a universal solvent called Alkahest, produced in an alchemical (i.e., by Cavendish's lights, artisanal) process, was a universal medicine.[26] Cavendish takes diseases to be caused by various kinds of motions, categorizable at least in part by their tempers and whether they are contracting motions or dilating motions. She holds that diseases have to be treated by countervailing medicines. So, for example, diseases caused by "Hot contractions" are best treated by "Cold Dilatating medicines" ([55], Part 7, ch. 11, p. 324). In this context, the epistemic relevance of her denial that artisans make the matter of parts concerns the expected success of medical treatments. Not having made the matter of parts, artisanal producers of medicines do not know the underlying causes of the observable behavior of those parts (or, as she puts it in the quotation reproduced above, "the several particular causes which make them [viz., the effects] to be so"). In fact In fact, the artists passage initiates a longer epistemological digression, and even when Cavendish decides "to return to the universal medicine", she continues the epistemological theme by emphasizing that "even the most experienced physician" lacks reliable epistemic access to what kinds of motions are involved in various diseases ([25], Part 2, ch. 22, p. 242), while the variety of motions underlying diseases of various kinds by itself suffices to render the notion of a universal countervailing medicine ridiculous, Cavendish diagnoses van Helmont's mistake as proceeding from his ignorance of the motions underlying the observable behavior of diseases and medicines both.[27]

The point about epistemic limitations generalizes to become the third important point to make about Cavendish's denial in the artists passage that artisans make the matter of parts of artifacts. The general version of the epistemic point is that we do not have certain epistemic access to why parts behave as they do. Artisans can occasion changes in their materials, but what happens upon such occasioning is mediated by the materials' own interior motions. That is, as the epistemological digression that follows the artists passage makes explicit, "the reason why [observable effects] are so" and "the several particular causes which make them to be so" has to do with interior motions not available to "the perception of sense[,]" so that "to judge of the cause, belongs only to reason" ([25], Part 2, ch. 22, p. 242). But reason itself cannot be sure of the interior motions that are actually causing appearances, either.

> For example, our sensitive perception patterns out an animal, a mineral, a vegetable, etc.; we perceive they have the figure of flesh, stone, wood, etc. but yet we do not know what is the cause of their being such figures: for, the interior figurative motions of these creatures, being not subject to the perception of our exterior senses, cannot exactly be known ([25], Part 1, ch. 37, Q12, p. 175)

The best reason can do is to "probably guess" at such motions ([25], Part 1, ch. 25, p. 100).[28] Cavendish shares this commitment to our epistemic limitations with the proto-mechanist Mersenne and the mechanist Hobbes.[29] But as will shortly be seen, she draws a different conclusion than they do from our epistemic situation.

Consider the following mechanist explanatory ambition. To explain something, a mechanist might think, is just to account for its behavior in terms of a concatenation of simple machines. Thus, for example, Galileo can be seen as attempting in [60] to "expand [the law of the lever] into a whole mechanics" ([61], p. 18). But all of Cavendish, Mersenne, and Hobbes accept that even a demonstration that a series of applications of the law of the lever would necessitate certain observable behavior fails to establish that the effects are actually being produced by a mechanism consisting of a concatenation of levers. The same observable effect might, after all, be produced in some other way.[30]

Unlike Cavendish, both Mersenne and Hobbes think that this epistemic situation is good enough for science to proceed.[31] On the one hand, science is simply to be restricted to the external, quantitative features of bodies that we can at least in principle know about.[32] Hobbes, for his part, thinks that there are no other features of bodies independently of how we think about them.[33] Further, he is typically concerned, in his physics, only to show how

various effects could be produced by appeal only to such external features, as if giving speculative proofs of concept for his mechanism.[34] On the other hand, both Mersenne and Hobbes presuppose that humans do know the true causes of their productions. Thus, for example, Mersenne says, as if concessively, that "we only know the real reasons for things that we can create with our hand and our mind" ([65], p. 8 as qtd. in [59], Section 4.3). Meanwhile, for Hobbes, fully half of philosophy involves knowledge of effects predicated on our having prior knowledge of their causes.[35]

Cavendish differs on both counts. She thinks that all effects are mediated by unobservable interior motions, and that this epistemic situation genuinely limits what humans can do. The epistemic upshot for science comes through most clearly in her criticisms of microscopy. She takes microscopes and telescopes to be scientifically useless, in part precisely because microscopes cannot reveal bodies' interior motions.[36] But interestingly, for Cavendish this epistemic situation is a consequence of the fact that artisans do not make their materials, which brings us to the fourth important point about the artists passage.

In the artists passage, Cavendish connects artists' not making their materials with their inability to "give a true or probable reason why [observable effects] are so, nor know the several particular causes which make them to be so". This connection suggests that, counterfactually—maybe, by Cavendish's lights, counterpossibly—if artists had made their materials, they would know the true reasons and several particular causes of their behavior.[37] But Cavendish reserves this kind of knowledge to nature and, crucially, takes it to be an essential prerequisite for natural production.

> the General actions of Nature are both life and knowledg, which are the architects of all Creatures, and know better how to frame all kinds and sorts of Creatures then man can conceive ([26], Part 2, Letter 7, p. 152)

The kind (or maybe depth) of knowledge involved in the natural production (or framing) of creatures is thus inconceivable to humans, and so perforce to artisans.[38]

But not so to parts of nature in general. That is, though Cavendish consistently describes knowledge as a general action of nature, she also consistently ascribes knowledge of how and why parts move to the parts themselves.

> But to return to knowledge and perception: I say, they are general and fundamental actions of nature; it being not probable that the infinite parts of nature should move so variously, nay, so orderly and methodically as they do, without knowing what they do, or why, and whether they move; and therefore all particular actions whatsoever in nature, as respiration, digestion, sympathy, antipathy, division, composition, pressure, reaction, etc. are all particular perceptive and knowing actions ([25], Part 1, ch. 35, p. 139)

The full import of the knowingness of sympathy in particular will become clear in Section 5. But already it can be appreciated that Cavendish is consistently committed to the claim that parts can act only because they know what to do.

> the sensitive parts do not only know their own work, but are also directed by the rational ([25], Part 1, ch. 37, Q5, p. 159)

A kind of knowledge inconceivable to human artisans is thus not only implicated in natural productions, but is a prerequisite for all action.

This invites the obvious objection that artisans themselves are parts of nature. Surely, the objection as stated is correct, but it is unclear whether it is to the point. Is an artist's sawing a division? Is her hammering a composition? Or do these large scale actions themselves involve countless smaller compositions and divisions, to say nothing of respirations, sympathies, etc. Cavendish tends to refer the knowledge underlying actions not to entire creatures, but to their constituent parts.

> although every part hath its own knowledge and perception; yet, when many parts are conjoined into one figure, then, by reason of that twofold relation of their actions and near neighbourhood, they become better acquainted. And, as many men assembled in a church, make but one congregation, and all agree to worship one God, in one and the same manner or way; so, many parts conjoined in one figure, are, as it were, so many communicants, all agreeing, and being united in one body. For example, all parts concurring to compose the figure of the eye, agree together, not only in the composition, but in the act of seeing or perception, and in all other things, if regular, that are proper to that figure. The same may be understood of the parts composing the ear, and requisite to its perception; and in like manner to the rest of the senses. So that, though the parts of the eye be ignorant of the parts of the ear, as being wholly and only employed about their own composition, and the properties thereof, yet are they not ignorant of what their own adjoining parts do. ([25], Part 1, ch. 37, Q5, pp. 159–160)
>
> For example, a man knows he has a digestion in his body, which being an interior action, he cannot know, by his exterior senses, how it is made; but those parts of the body where the digestion is performed, may know it; nay, they must of necessity do so, because they are concerned in it, as being their proper employment ([25], Part 1, ch. 37, Q12, p. 175)

Of course, Cavendish does not limit her favorable comparison of the knowledge of parts to entire creatures to just our species.

> And why may not the sensitive and rational part of Matter know better how to make a Bee, then a Bee doth how to make Honey and Wax? or have a better communication betwixt them, then Bees that fly several ways, meeting and joyning to make their Combes in their Hives? ([26], Part 2, Letter 7, p. 153)

So, eye parts, ear parts, digestive organs, and the matter that makes up bees all have the relevant kind of knowledge. In an ironic twist, though Cavendish often compares rational matter to a designer or architect, human designers and architects themselves apparently lack the kind of knowledge required to guide the particular motions required to frame creatures. Still, for Cavendish's comparisons with humans to be instructive, we must know something. But I take it that we know things like how to saw and how to hammer, and not things like what our stomachs are doing, or (to return to artifacts) what an artisans' materials are doing.

This, finally, brings us to the fourth point: artisans, who do not produce their materials, and consequently (according to Cavendish's inference) do not know the causes of their observable behavior, are epistemically poorly positioned to relevantly inform their materials. This matters to Cavendish's theory of artifacts because it has implications for whether artifacts can be unified bodies, or in other words, whether artisans actually have the *techne* required to produce artifacts as unified bodies.[39] Cavendish has a substantive story about the unity of complex bodies.[40] In particular, she takes complex bodies to be unified by sympathies between the interior motions of their parts. It is important to note that parts behaving in sympathy with one another is something over and above their being merely juxtaposed with one another. So the question whether artisans have the *techne* required to make artifacts unified bodies is, for Cavendish, the question whether they have the power to get their parts to behave in sympathy with one another. Artisans' materials themselves would need knowledge of how to move—to "know their own work"—in order to do so. But artisans lack knowledge of how their materials are moving to begin with. So it is unclear how they could have, much less impart, knowledge of how to behave in sympathy with one another.[41] But before considering these issues more carefully, the next section attends to the positive side of the artists passage, returning to the question what "dissolv[ing] and compos[ing] several parts several ways" amounts to.

4. Mere Rearrangement, Production, and Generation

The artists passage says that artisans can "occasion" parts to "dissolve and compose". Cavendish's talk here of dissolving or dissolution is potentially misleading, insofar as dissolution is the counterpart of production, whereas it is division that is the counterpart of composition. The step from division to dissolution, like the step from composition to production, is small, but extant.[42] Cavendish is most naturally read as thinking that division and composition are kinds of local motion.[43] Production and dissolution are potential consequences of such local motions: compositions result in productions when new unified complex bodies are produced, whereas divisions result in dissolution when unified complex bodies are dissolved, as when creatures die.[44] Significantly, Cavendish is willing to talk in terms of "artificial productions" ([25], Part 1, ch. 14, p. 67 and Part 2, ch. 2, p. 198), but this leaves open what exactly is produced, and how artificial production falls short of generation.[45]

In some passages, she suggests that artisans' rearrangements actualize the power of parts to produce an artifact. She says, for example,

> the house being not there, it cannot be said that either place or house are annihilated, viz, when the materials are dissolved, no not when transformed into millions of several other figures, for the house remains still in the power of all those several parts of matter ([26], Part 1, Letter 17, p. 57)

If the house is only in the power of the parts when it's not still there, then when it is there, that power has been actualized. Further, if composing house parts actualizes a power, then an artificial production is an actuality. But this should be a case of generation, namely, the generation of the actuality. It may bear saying here that actualities are not obviously part of Cavendish's official ontology. Further, Cavendish clearly aims to avoid the conclusion that anything, actuality or otherwise, is generated in the production of a house:

> changing into such or such a figure is not the motion of Generation, which is to build a new house with old materials, but onely a Transformation; I say a new house with old materials; not that I mean there is any new Creation in nature, of any thing that was not before in nature; for nature is not God, to make new beings out of nothing, but any thing may be called new, when it is altered from one figure into another. ([26], Part 1, Letter 21, p. 71)

This passage has a nominalist, or at least linguistic, tinge. Things like houses "may be called new" without being genuinely new creations. Cavendish thus shares nominalists' metaphysical parsimony, avoiding metaphysical profligacy via an appeal to language. But Cavendish is not straightforwardly a nominalist; unlike Hobbes, for example, she never talks about names explicitly.[46] Nevertheless, the transformation-generation distinction in this passage is conceptually Ockhamist. For Ockham, artifacts are, as Zupko puts it, "essentially rearrangements" so that "no new thing is thereby created" ([70], p. 88). Moreover, as [69] notes, philosophers like Bacon and Descartes, whose works Cavendish definitely knew, who wanted to "avoid positing creation and annihilation of modes" could "accept rearrangement of parts" as an alternative (p. 483).[47] So this conceptually Ockhamist move was historically accessible to Cavendish, despite her monolingualism.

The impression that Cavendish's generation-transformation distinction has Ockhamist credentials can easily be deepened. In Cavendish's official ontology, artificial productions are figures.[48] As Paul Bakker revealed in [73], for John Buridan and Albert of Saxony, the ontological status of artifacts depends on the relationship between figures and what is figured. Both Ockham and Albert of Saxony hold that figure is a figured magnitude, and this latter is the same thing as the underlying substance. They thereby avoid any commitment to the generation of a distinct artifactual form.

Though there is no reason to think Cavendish knew any of the Scholastic positions described in the previous paragraph, she reproduces the result.[49] For her, what is figured are the parts of the artifact. Following the Buridanian setup, rearrangement of parts by local motions should count as generating something new—relevantly, an artifact—if the

figure is something distinct from the figured parts. But rearrangement of parts by local motions should not count as generating something new—relevantly, an artifact—if the figure is not something distinct from the figured parts. Now, figures, for Cavendish, are not merely shapes.[50] Rather, for Cavendish, figures are numerically identical with bodies.

> When I say, *That Place, Space, Measure, Number, Weight, Figures, &c. are mixed with Substance*, I do not mean they are incorporeal, and do inhere in substance as so many corporeal modes or accidents; but my meaning is, they are all corporeal parts and actions of Nature. . . ; for Place, Figure, Weight, Measure, &c. are nothing without Body, but Place and Body are but one thing, and so of the rest. ([26], Part 4, Letter 33, pp. 535–536)

> The former answered, that motion and body were not two several substances; but motion and matter made one self-moving body; and so was place, colour, figure, etc. all one and the same with body. ([25], "An Argumental Discourse", p. 37)

By "so of the rest" in the former passage, Cavendish means (among other things) that figure and body are but one thing. The former thoughts of the "Argumental Discourse" also say that figure and body are one thing. That is, for Cavendish, figures and bodies are just numerically identical.[51] So, if conceptual space is set up in the way that Bakker's Buridan set it up, Cavendishian rearrangements are not new generations. Moreover, this is not just an unearned terminological stipulation, but a commitment reflected in Ockhamist features of Cavendish's metaphysics. That is, her transformation-generation distinction is cashed out in terms of mere rearrangement and then metaphysically grounded in her identification of figures and bodies.

It bears noting that the identification of figure and body is a move that Cavendish makes in a more general form, as is visible in the passages reproduced just above. Ref. [78] has recently noted that Cavendish denies that accidents can be generated or annihilated, but her position is stronger than this: she denies accidents, full stop. She is aiming at a metaphysics of only bodies, that is, a metaphysics of substances without accidents. She has, in Alison Peterman's terminology, a "one-category ontology".[52] The challenge of making sense of Cavendish is in large part the challenge of rebuilding an adequate theoretical superstructure with only the resources provided by that ontology.[53]

5. Love and Art

The artists passage says that artisans can produce artifacts by occasioning the division and composition of parts, and the previous section elaborated on this means of production as mere rearrangement of parts. The results of such rearrangements typically fall short of natural productions. As Cavendish colorfully puts it,

> art is not only gross in comparison to nature, but, for the most part, deformed and defective, and at best produces mixt or hermaphroditical figures ([25], Part 1, ch. 3, p. 53)

What makes artificial figures "hermaphroditical" is that they are "partly artificial, and partly natural" ([25], Part 1, ch. 3, p. 50).[54] This is related to the artisan not making the matter of the parts that are rearranged: the artisan takes natural objects, like pieces of wood, and occasions their rearrangement into artificial productions, like houses. The artisan does not thereby make something fully artificial; the house parts are still natural pieces of wood. The Cavendishian artisan is thus unlike the Aristotelian carpenter who has the expertise to make wood first into beams so that the beams can then be used to build houses. That is, while Cavendish allows that artisans can produce houses and microscopes, she holds that their artistic powers are limited by the affordances of (potentially somewhat stubborn) natural materials. But it is not as if Cavendish thinks that natural productions never dissolve, or that parts of one natural production cannot become fully natural parts of some other natural production.[55] What is lacking in the case of artificial productions, this section aims to establish, has to do with a lack of creaturely unity in artificial productions as complex wholes, which is related to the Cavendishian artisan's inability to simply make their materials.

Cavendish gives a substantive account of creatures as associations or societies of their parts, united by sympathy.[56] As [11] argues, Cavendish understands natural production to take place via an epigenetic process that takes place "by degrees, which requires time, and is not done in an instant" ([25], Part 1, ch. 14, p. 67, qtd. at [11], p. 12).[57] Cavendish attributes this production to precisely those parts of nature that become parts of the naturally produced creature.[58]

> The Self-moving Parts, or Corporeal Motions, are the Producers of all Composed Figures, such as we name *Creatures* . . . such Composed Figures which we name *Creatures*, are produced by particular Associations of Self-moving Parts, into particular kinds, and sorts ([45], Part 3, ch. 1, p. 27)

The parts effect this association by working together sympathetically or, as Cavendish sometimes puts it, by "consent and agreement".

> all Natural Creatures are produced by the consent and agreement of many Self-moving Parts, or Corporeal Motions, which work to a particular Design, as to associate into particular kinds and sorts of Creatures. ([45], Part 3, ch. 4, p. 31)

Further, the parts of a sympathetically united creature love one another passionately, and the creatures love themselves.

> Passionate Love belongs to several Parts, so that the several parts of one Society, as one Creature, have both Passionate Love, and Self-love, as being sympathetically united in one Society ([45], Part 5, ch. 21, p. 68)[59]

Sympathy is involved for a second time at this stage. For example, in a relatively early text, the 1655 edition of *Philosophical and Physical Opinions*, Cavendish claims that the "Sympathetical" and "Antipathetical" motions involved in war and peace "proceed from Self-preservation" as "*motion* in every *Figure* strives to maintain what [it] has created" ([19], ch. 22, p. 6). Her more mature texts return to this theme. For example, she attributes a drive for self-preservation to the passionate love between parts.

> the Self-moving Parts of a Human Creature, being associated, love one another, and therefore do endeavour to keep their society from dissolving ([45], Part 6, ch. 5, p. 75)

She attributes agreement and disagreement, terms in which she sometimes talks about sympathy and antipathy, directly to creatures' overarching self-love.[60]

> all Creatures have self-love . . . when Parts agree or disagree, it is out of Interest and Self-love ([26], Part 1, Letter 8, p. 35).

Both forms of love thus play a role in preserving of the creature by encouraging continued sympathy between its parts, as [67] has argued. This is a social account of creaturely unity.[61] As such, it reflects Cavendish's panpsychism, that is, her view that every part of nature is minded in virtue of containing animate (i.e., sensitive and rational) constitutive parts.[62] What I want to claim here is that the artisan's lack of control over the parts and how they behave undermines the possibility of achieving this kind of social unity among the parts of artificial productions. In particular, the artisan cannot control whether the parts love one another or behave sympathetically with one another.

Before making that argument, I want to compare the present theory with Deborah Brown and Calvin Normore's allegedly Cartesian theory of artifactual unity. On that theory, the composite of a human and an artifact that she "love[s] to use" "qualifies. . . as an *ens per se*, albeit one that is not the product of nature alone but of nature in cahoots with art" ([94], p. 218).[63] So by projecting unity onto the loved object, a new composite being is created, on Brown and Normore's view.[64] The bar for loving something on this theory is very low: agents can only do things they take to be good, so they will by default count as loving any artifact they use. So this has the potential to be a general story about how a new entity is created any time anyone uses an artifact, while I do not think this account of artifactual unity can be found in Descartes, I do think love is crucial to Cavendish's understanding of

the defective unity of artifacts. The relevant question is now whether artisans can induce natural parts to love one another.

For a certain category of artifacts, viz., artificially selected breeds of animals and plants that I will follow [97] in calling "biological artifacts", the answer is plausibly yes. An animal, for example, is a "whole and perfect figure" for Cavendish ([25], Part 1, ch. 31, p. 126). Whole and perfect figures are unified, which requires their parts to love one another, as [67]'s account of Cavendishian creaturely unity goes. So (as [70] argues for Ockham) artisans can presumably actually create new breeds. So for biological artifacts, where artisans co-opt natural processes to produce novel whole and perfect figures, the artifacts' parts end up loving one another.

But for non-biological artifacts, artisans' limitations are not so easily overcome. From her commitment that artisans do not make their materials, Cavendish infers that they do not know their interior motions. In Section 3, this ignorance was highlighted to cast doubt on whether artisans have the requisite knowledge to inform their living and knowing materials about how to move in order to move sympathetically. But even if artisans did have the relevant knowledge, it is unclear that their materials would obey them. What is most important here is whether they can control the motions of their materials.[65] In the case of stereotypical (non-biological) artifacts, artisans arguably lack control in a way that immediately results in their being unable to make parts love one another. Consider the objections lodged by an oak tree against being made into a house, in an early Cavendish poem.[66]

> Both *Brick*, and *Tiles*, upon my *Head* are laid,
> Of this *Preferment I* am sore afraid.
> And many times with *Nailes*, and *Hammers* strong,
> They peirce my *Sides*, to hang their *Pictures* on.
> My *Face* is smucht with Smoake of *Candle Lights*,
> In danger to be burnt in *Winter Nights*.
> No, let me here a poor *Old Oake* still grow;
> *I* care not for these vaine *Delights* to know.
> For *fruitlesse Promises I* do not care,
> More *Honour* tis, my owne *green Leaves* to beare.
> More *Honour* tis, to be in *Natures* dresse,
> Then any *Shape*, that *Men* by *Art* expresse.
> *I* am not like to *Man*, would Praises have,
> And for *Opinion* make my selfe a *Slave*.
> ([18], "A Dialogue between an Oake, and a Man cutting them downe", p. 69)

Cavendish's literary works are non-trivially polyphonous.[67] This makes identifying voices in her poems as Cavendish's own voice rather difficult, but what it makes easy is recognizing voices as belonging to Cavendish's characters. That is, the oak's objections to being made into a house can be taken as reflecting Cavendish's attempt at characterizing oak trees. They therefore reveal that Cavendish thinks that oak trees would rather not be forced into artifactual shapes. (The poem is long, and the tree also objects to being made into a ship). The oak tree's preferences are relevant for present purposes because whether the artisan can produce a house as a unified creature depends on whether the wood of the house is prepared to behave in sympathy with, and to love, the other parts of the house. "A Dialogue between an Oake, and a Man cutting them downe" suggests fairly clearly that Cavendish would take the answer to be no.[68]

The oak tree's resistance, moreover, seems to extend to the maintenance of its own identity in the face of artistic manipulation. The oak tree's objection is not that some of its parts might be made into beams, for example. There is no prospect of a carpenter being able to transform the oak's parts in that way. (Recall the discussion of the negative side of the artists passage: it is unclear that the artisan could know how the oak tree ought to behave in order to transform into a sympathetically unified artifact to begin with). The best a builder could do would be to torture an oak tree. In the absence of Stockholm syndrome,

then, there is no prospect of a stereotypical artifact like a house being unified by passionate love or sympathy between its parts. Stereotypical artifacts are thus lacking in unity, and this is why they are "deformed and defective" relative to natural productions. (Note that, on the present account, the defectiveness of artifacts is a separate property from their hermaphrodity).

Further, insofar as it is passionate love between the parts of a unified creature or a creature's self-love that plays a role in its continued existence, artifacts will be relatively non-stable. At least some of Cavendish's contemporaries understood instability as a mark of inferiority.

> duration is the measure of every thing's excellence. . . that a thing perishes it hath from art; that it lasts more or less, it hath from nature" ([51], Conference 82.1, p. 481)[69]

This instability, I want to suggest, is why art is only "nature's sporting or playing actions" and why the products of art are merely toys.

Natural creatures are unified by sympathy. Their parts love one another and they love themselves, all of which motivates them to maintain themselves in existence, by continuing to behave sympathetically. This motivational structure underlies natural growth, healing, and everything that conspires to extend the lives of natural creatures. But artifacts and their parts, judging from "A Dialogue between an Oake, and a Man cutting them downe", are liable to lack every part of this motivational structure, and every one of its salubrious consequences. The heretofore uninvoked gender and political aspects of Cavendish's account appear suddenly to have returned: lacking any serious longer term commitment to their union, parts of stereotypical artifacts are just playing around.[70] Their artificially occasioned association will be, for the relatively short time it lasts, a matter of externally imposed happenstance and temporary convenience. Of course, there is nothing in Cavendish's metaphysics to stop parts of nature from sympathetically unifying with and passionately loving any other parts of nature they may so choose. But, unless they happen to do so on their own, there is no reason to expect the artisan to be able to influence their motions to an extent sufficient to mold their passions so that they start to behave sympathetically or love one another.[71]

6. Conclusions

The foregoing account of Cavendish's vitalist theory of artifacts attempts to view her philosophy in terms of its relationship to Scholastic thought. Like mechanists, Cavendish rewrites Scholastic distinctions by putting everything on one side of the art–nature distinction. Unlike mechanists, she puts everything on the nature side, in a sense. She also explicitly distances her theory of art from an orthodox Aristotelian account of artistic production by denying that artisans can make their materials. Instead, Cavendishian artisans merely rearrange parts of nature: artistic productions are hermaphroditical precisely in that they are artfully produced arrangements of natural parts. Mere rearrangement cannot be genuine generation, moreover, because nothing natural can result in genuine generation. But this terminological stipulation is seen to be borne out, on the present interpretation, by Cavendish's conceptually Ockhamist identification of figure with body. Whether rearrangement results in a unified creature depends on whether the parts rearranged are thereby disposed to sympathize with and love one another, in accord with Cavendish's theory of the unity of complex bodies. Though the material parts of biological artifacts presumably are disposed to unify in this way, the material parts of stereotypical artifacts—things like microscopes and houses—are not, which provides the literal content for Cavendish's metaphorical claims that artistic productions are "deformed and defective". Their resulting instability accounts for her further metaphorical conception of art as nature's play.

What is striking in this reconstruction is how much philosophical content Cavendish's theory of artifacts reworks. Though some of Cavendish's historical knowledge can be attributed to [50], she clearly knows more than he says. Some of the distinctions she works with can be traced to [51], but like Walter Charleton's "Infidels, who refuse to believe, that [Cavendish has] alwayes preserved [her]self so free from the Contagion of Books, and

Book-men", we are still forced to speculate about how she knew enough to write what she did ([102], p. 146).[72] Moreover, in addition to the reworkings of Aristotelian and Ockhamist concepts to which Cavendish plausibly had some historical (if mediated) access, there is also her apparently original reproduction of a conceptually Ockhamist metaphysical basis for the transformation-generation distinction in her identification of figures and bodies. This identification is itself part of a defensible systematic metaphysics that we are still only just beginning to recover.

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Notes

1 See, e.g., [1], pp. 30ff. and [2], Section 4.4.

2 See [3]'s analysis of continuities between mechanist and Scholastic views in connection with the art-nature distinction.

3 On Cavendish's vitalism, see, e.g., [4], p. 229 and [5], Section 2b.

4 See, e.g., [6,7]; [8], esp. pp. 171–173; [9,10].

5 In a similar vein, [11] presents Cavendish's account of epigenesis, and more broadly the rationality of nature, by comparison with William Harvey, whose commitments in these areas were, as Goldberg reconstructs them, Aristotelian.

6 See, e.g., the book-length treatments of [12–16].

7 For Cavendish's famous description of the limits of her childhood education, see [17], pp. 279–280. For her professions of monolingualism, see [18], "To Naturall Philosophers", sig. A6r and [19], "An Epiloge to my Philosophical Opinions", sig. B3v. Liam Semler has in [20–22] been concerned to account for Cavendish's 1650s-era knowledge of philosophy in terms of what she might have read, including hypothesized but otherwise unknown manuscripts, while [23] claims that Cavendish "drew on Aristotelian-Scholastic sources" (p. 157), but attributes her knowledge at various points of her life to conversation (pp. 276–277) and "reading English commentaries" (p. 23). See also [24], pp. 6–9 for a discussion of Cavendish's philosophical education as dependent upon personal interactions with her family members and exposure to their impressive circle (including Mersenne, Gassendi, Descartes, and Hobbes, among others).

8 The interpretation is thus a version of the "radically nominalist" interpretation of Cavendish that Colin Chamberlain has characterized as "difficult to understand" at [27], pp. 327–328, note 67.

9 For discussion of Cavendish's conception of the art/nature distinction from "political and gender perspectives" ([28], p. 58), see [28–30].

10 Compare [24]'s suggestion that Cavendish "struggled to reconcile" organicist and mechanistic philosophies (11) to the accounts of Cavendish as rejecting mechanism at, e.g., [4], pp. 222–225 and [31], pp. 312–313.

11 See, e.g., Descartes, *Principia Philosophiæ*, Part II, ch. 37 ([33], pp. 62–63; [34], p. 241); [35], ch. 8, art. 19, pp. 83–84 and ch. 9, art. 7, p. 90; and (for one of Locke's most definitely mechanist moments) [36], p. 180.

12 See, e.g., [37], pp. 136–138 on Boyle, and [1], pp. 142ff for the general claim.

13 Ref. [2], pp. 101–102. [38], p. 119ff. emphasizes similarities between the Platonic Demiurge and human artisans as early as Cicero. But see [39], p. 362 and [40], pp. 81–87 for the expression of doubts about whether the cosmos was thereby seen as a machine already in ancient times. Thanks to Miira Tuominen for discussion of this last point.

14 On God as *artifex maximus*, see [2], pp. 4–5. On the (self-)aggrandizement of the human *artifex* already in the medieval period, see [41].

15 On animate matter as present in every part of nature, see [42], pp. xxiv–xxv. On the identification of animate matter and self-motion in Cavendish's mature works, see [43], pp. 3554–3555.

16 It is easy to think Cavendish is confused here, insofar as things that are moved cannot move themselves: "is moved" is a passive construction for a reason, so things that move themselves are not, in the relevant (passive) sense, moved. But Cavendish knows this, and plays with the distinction elsewhere (see, e.g., [25], "An Argumental Discourse", pp. 26–27). She is just using her discussion of the Aristotelian principle to make a point she makes often, viz., that all motion is self-motion.

17 But see, for example, [25], Part 1, ch. 28, p. 119.

18 Cf. [29], p. 132. The relationship between Cavendish's version of the art-nature distinction and that distinction in Aristotle may be subtler than this claim suggests. A proper understanding of the distinction in Aristotle might also grant nature(s) a determinative role even when it comes to art, so that Cavendish's position here is more properly considered a mere rejection of mechanism than an innovation in its own right. But as the consideration of making materials in the next section further confirms, Cavendish seems to at least intend to put some distance between her position and orthodox Aristotelianism about art. Thanks to Ekrem Çetinkaya for discussion of this issue.

19 As [25]'s editor Eileen O'Neill notes, the reference is to [44], pp. 192–193.

20 Cf. note 15 above.

21 See also [45], Appendix, Part 5, ch. 3, p. 294. For discussion of this aspect of Cavendish's criticism of experimental science, see, e.g., [46,47].

22 There continues to be controversy over how to understand Cavendish's theory of causation. Ref. [31] reads Cavendish as intentionally but esoterically adopting a Chrysippean theory of occasional causation, while [7] attributes to Cavendish a theory of genuine mind–body interactions. For a recent discussion that vindicates Cavendish's occasionalist language, see [49].

23 Aristotle consistently counts bricks among the materials of a house: see also *Physics*, Book II, ch. 9, 200a24-26 ([32], vol. 1, p. 341); *De Anima*, Book I, ch. 1, 403b1-8 ([32], vol. 1, p. 643); and *Metaphysics*, Book VII, ch. 7, 1033a19-21 ([32], vol. 2, p. 1631). Thanks to Ekrem Çetinkaya for directing me to the *Physics*, Book II, ch. 2 and *De Anima*, Book I, ch. 1 passages.

24 Of course, there is a sense in which Aristotle himself does not think that artisans make their materials: they do not make the material cause of the bricks themselves (say, the elements). But insofar as he and Cavendish share the distinction between simply making and making serviceable, and Aristotle alone endorses the claim that artisans simply make (for example) bricks as a material out of which houses can be made, he holds the view which I take Cavendish to intend to reject in the artists passage. Thanks to an anonymous referee for *Philosophies* for pressing me on this point.

25 The basic distinction between things that exist by nature and those that exist by art, drawn at *Physics*, Book II, ch. 1, 192b9-20 ([32], vol. 1, p. 329), is described in [50], Part 6, "The Doctrine of Aristotle", ch. 3, p. 44, sig. (fff 3)v, a work that Cavendish describes reading at [25], Part 3, p. 249. It's unclear where she might have picked up her further apparent knowledge of Aristotle's commitment to artisans making their materials, as [50] does not to my knowledge discuss it, and Cavendish does not return to the negative side of the artisans passage in her explicit discussion of Aristotle at [25], Part 3, ch. 5, pp. 267–272. It's possible she knows the distinction but does not associate it with Aristotle. For example, she might mean to express agreement with the position that "Art can make nothing but by the help of natural and perfect bodies. . . which it only divides or conjoynes; as when the Architect builds a House" ([51], Conference 82.1, p. 483). (Though scholars sometimes talk as though Cavendish's reading in contemporary philosophy was a different project than her study of Thomas Stanley's history of philosophy (see, e.g., [42], p. xv), some of the contemporary texts she read themselves functioned as secondary sources on the history of philosophy. [52], for example, typically runs through various historical positions before taking a side. One scholar to have recognized this role of contemporary texts is [23], who discusses Cavendish's reading of Stanley at length, but nevertheless also counts works by William Harvey and Meric Casaubon as among the "most momentous for Cavendish's understanding of Aristotle" (p. 276). As for [51], Cavendish praises it at [26], Part 4, Letter 22, p. 496. Further, of course, as noted at, e.g., [24], pp. 6–9, she learned a lot from participating in or just being present for philosophical conversations between *cognoscenti*).

26 See, e.g., [53], p. 42, which refers to [54]. For a more general account of contemporary alchemical debates in the background of Cavendish's art-nature distinction, see [28].

27 For a particularly scathing indictment of van Helmont for "superficial knowledg in the Art of Physick[,]" see [26], Part 3, Letter 42, p. 405.

28 See also [25], Part 1, ch. 37, Q3, p. 158 and Part 1, ch. 37, Q12, p. 175. Comments like these are sometimes construed in the literature as if they are mere reflections of Cavendish's general probabilism ([56]) or fallibilism ([7]) about her philosophical system as a whole, but the claim is quite strong: we can never do more than guess at the interior motions that actually cause—as opposed to merely occasionally causing—anything. Cavendish is explicit about this in the very first work she wrote: "[natural philosophy] is of little or no use, onely to exercise their Opinions at the guessing at the Causes of Things, for know them they cannot" ([57], Lib. 3, Part 2, p. 158 [actually p. 160]). Cavendish becomes more sanguine about the probability of her guesses over time, but she never really abandons this view. For discussion of Cavendish as a mitigated skeptic, see [58], Section 7.

29 On Mersenne's relationship to mechanism, see [59], Section 4.3.

30 See, e.g., [35], ch. 1, art. 5, p. 5.

31 See [62], Section 1.1.

[32] On the relationship between Mersenne's and Hobbes's epistemology and their mathematization of physical space, see [62], Section 1.2.

[33] On the extent of Hobbes's "antirealism" about accidents, see [63].

[34] See, for instance, the relatively low bar Hobbes has set for his speculations at [35], ch. 26, art. 11, pp. 329–330. Scholars usually follow Hobbes's terminology in discussing such speculations as "hypotheses": see, e.g., [64].

[35] See the definition of philosophy at [35], ch. 1, art. 2, p. 2.

[36] Ref. [25], Part 1, ch. 3, pp. 52–53. This is only part of her criticism, as she also thinks optical instruments distort bodies' exteriors: see, e.g., [25], Part 1, ch. 3, p. 51.

[37] Perhaps here again the Hobbes comparison is instructive, as Hobbes held that we could definitely know the effects of known causes.

[38] The relevant notion of inconceivability here is a matter of what humans can understand, and in particular does not track any kind of possibility. As Cavendish employs the notion of (in)conceivability, it does not even constrain actuality. On the actual variety of nature outrunning human conceptual capacities, see, e.g., [25], Part 1, ch. 13, p. 65 and Part 1, ch. 14, p. 68. On the actual infinity and wisdom of nature defying human conceivability, see [25], Part 2, ch. 14, p. 220 and Part 1, ch. 9, p. 60, respectively.

[39] It also raises a more general question: how can artisans (or anyone) do anything? The short answer is by serving as occasions, and in particular as occasions for parts of nature to do what they (and not we) know how to do, as will be discussed below in Section 4. This paper is focused mostly on the negative side of the story, since the positive side is presumably just a special case of Cavendish's more general theory of causation. (On controversies surrounding that theory, see note 22 above). But it may be that future work finds a more interesting story to tell, as [66] has done for Ockham in this issue.

[40] This substantive story is presented in [67], ch. 4 and discussed in [68], as well as below in Section 5.

[41] As an anonymous reviewer for *Philosophies* notes, artisans' not making their materials is, on the present account, both explained by artisans' epistemic limitations and invoked by Cavendish to explain certain of those limitations. I take it that Cavendish reasons as follows: If artisans had (counterfactually or perhaps counterpossibly) made their materials, they would know (as the artists passage puts it, in what I take to be a Hobbesian inference) "the several particular causes" underlying their behavior. But they did not make their materials, because they lack the knowledge required to do so, and the artisans' ignorance only grows from there.

[42] Ref. [69] identifies division and composition in Cavendish with mereological change. This identification implies a more trivial conception of wholes than the substantive conception of unified complex bodies with which this paper operates.

[43] Ref. [69] denies that composition and division are local motions on the basis of Cavendish's denial that bodies can change places (Section 2.2), and argues that all motion for Cavendish is rather mereological change or "compositional motion" (Section 3.1). Though engaging with the details of Peterman's arguments is outside of the scope of this paper, suffice it here to say that Cavendish repeatedly asserts that all motions are local motions (at, e.g., [25], "An Argumental Discourse", p. 28 and [45], Part 11, ch. 8, p. 171) and that she explicitly denies (at [25], Part 1, ch. 30, p. 125) that contraction and dilation involve mereological change. (I discuss Cavendish's theory of place and its implications for her understanding of local motion elsewhere).

[44] On productions, see, e.g., [25], Part 1, ch. 14, pp. 66–68. On dissolution as death, see, e.g., [25], Part 2, ch. 5, p. 204.

[45] While this section is focused on artificial productions, many of Cavendish's claims are stated with fuller generality. Detailed discussion of how natural production goes beyond artificial production requires diving deeply into the panpsychist elements of Cavendish's vitalism, and so will have to wait for Section 5.

[46] By way of contrast, ch. 2 of [35] is entirely about names.

[47] Robert Boyle, whose work Cavendish also definitely knew, likewise denied that rearrangement resulted in new creations, and advanced the nominalist claim that rearrangement merely justified "a new Denomination" or name, though he was willing to call what is produced "a new modification or manner of existence" ([71], p. 81). For comparison of Boyle's view here with a position considered (but not ultimately endorsed) by Abelard, see [72], pp. 124–126.

[48] See, e.g., [25], Part 1, ch. 3, p. 53.

[49] The remainder of this section depends on the claim that Cavendish's "one and the same" and "but one thing" claims are meant to express numerical identity claims. I give this interpretation an elaborate exposition and defense in another work-in-progress, but here readers who do not accept the claim may have to doubt the depth of the Ockhamist credentials of Cavendish's generation-transformation distinction. That said, in deference to referees' interest in a more elaborate discussion, I offer the following motivation of the numerical identity reading: Both Hobbes and Digby—philosophers Cavendish personally knew, and with whose works she was definitely familiar—avoid metaphysical commitments to accidents or properties by referring them to our mental representations, insisting on the oneness of substances out there in the world. Thus, Digby, discussing his sense impressions of an apple in a passage that [74], p. 241 suggests Cavendish knew, notes that "what is but one entire thing in it selfe, seemeth to be many distinct thinges in my understanding" ([75], Treatise 1, ch. 3, p. 3) and warns against the error of "a multiplying of things, where no such multiplication is really found" ([75], Treatise 1, ch. 3, p. 2). (For Hobbes, see [35], ch. 8, art. 2, pp. 75–76; for a reading of Hobbes as eliminating metaphysical commitment to accidents, see [76], Section 7.1; for criticism of [76], see [63]). Cavendish's intellectual milieu was thus clearly marked by a concern to avoid metaphysical commitment to

accidents as additional entities over and above bodies. So it is at least reasonable to consider that her assertions that various Scholastic accidents are "but one thing" with body might indeed be numerical identity claims.

50 Cf. [77], Section 4.1 on artificial forms as shapes. Cavendish does have a notion of "Exterior figure" that tracks shape (see [55], Part 4, ch. 34, p. 149), but that is not the notion of figure at issue here.

51 On this interpretation of "but one thing" claims, see note 49 above.

52 The members of this category are variously described not only as "bodies", "figures", and (especially when pounding the table about what is not to be admitted) "things", but also as "parts (of nature)" and (most idiosyncratically) "corporeal figurative motions". Whether all of these locutions are intended to pick out the same things is, of course, a matter for future scholarly controversy.

53 Peterman attempts to rebuild via mereology, a project begun in earnest with [69].

54 Whereas I take the partly artificial, partly natural character of artificial productions to exhaust what Cavendish intends by her labelling of them as "hermaphroditical", [79], pp. 37ff. makes much more of the sexual and gendered nature of the metaphor, attributing to Cavendish historical knowledge of connections between art and hermaphroditism in Paracelsian thought. (It is perhaps worth noting that the discussion of hermaphrodites at [51], a work Cavendish knew, covers debates about the possibility of natural hermaphroditism in Conference 100.2, pp. 577–580, but does not make the Paracelsian connection to art explicit).

55 See the discussion of Cavendish's commitment to a "transmutability thesis" at [80], p. 184.

56 The initial version of this paragraph merely invoked Deborah Boyle's reconstruction of Cavendish's account at [67], pp. 93–94, which focuses on the role of (passionate and self-)love in motivating a drive for self-preservation which leads, in turn, to sympathetic motions. The present version considers more explicitly how creatures are initially produced, though I rely in no small part on textual evidence compiled in [67]. Credit for encouraging me to go into further detail here is due to two anonymous referees for *Philosophies*.

57 See also [55], Part 1, ch. 1, p. 30 and Part 1, ch. 2, p. 32; [26], Part 2, Letter 7, pp. 151–152 and Part 4, Letter 2, p. 248; and [45], Part 3, ch. 5, p. 32; Part 4, ch. 2, p. 40; Part 7, ch. 11, p. 101; and Appendix, Part 5, ch. 8, p. 302, as well as [25], "An Argumental Discourse", p. 26 and p. 29.

58 Cf. Benny Goldberg's attribution of natural productions to nature as a whole, appealing to passages describing nature's governance of her parts at [11], p. 16. Goldberg's picture is thus top-down whereas the picture presented here is bottom-up. The two pictures are often seen as in tension with one another—see, e.g., [49]'s distinction between top-down, bottom-up, and for that matter lateral causal relations in Cavendish—but it is unclear that Cavendish would have seen them that way, given her claim that "a whole and its parts differ not really, but only in the manner of our conception" ([25], "An Argumental Discourse", p. 31). That is, Cavendish can be read as understanding the claim that nature produces creatures, on the one hand, and the claim that parts of nature produce creatures, on the other, as made true by the same features of reality. Resolving the puzzles invited by this view is, of course, well beyond the scope of this paper.

59 This passage can be read as confirming the suggestion of [67] that a creature's self-love "results from the passionate love between the parts" (p. 93). Note that, in line with Cavendish's panpsychism, "even Hard stones" love themselves ([55], Part 5, ch. 27, p. 194).

60 See, e.g., [55], Part 7, ch. 1, p. 307 for the conception of sympathy as agreement.

61 On "quasi-social" features of Cavendish's metaphysics, see [81], p. 220.

62 What exactly follows from containing sensitive and rational constitutive parts is a difficult question, the full resolution of which lies outside the scope of this paper. As early as [82], the ubiquity of sense and reason is suggested to imply that "*Vegetables* & *Minerals* may know/As *Man*, though like to Trees and stones they grow" ("Of Sense and Reason exercised in their different shapes", p. 56). [42], expressing the standard view (as also seen in, e.g., [83], p. 499; [84], p. 459; [85], p. 87, note 15 and p. 90, note 23; [10], Section 2; [86], Section 1; [87], p. 286; [5], esp. Section 2c; [88], pp. 28–30; and [89], p. 22), held that panpsychism follows "directly from Cavendish's application of the theory of blending" as applied to sensitive and rational matter (p. xxv). [90] notes that, for Cavendish, "every part of nature contains the same rational principle as humans", so that when she "wants to give an explicit account of the rational souls of humans, all she has to do is identify the rational soul with a person's rational animate matter" (pp. 636–637). (In addition to [25], Part 2, ch. 15, p. 221, cited at [90], p. 637, see, e.g., the claim that "the Mind is Animate matter" at [55], Part 6, ch. 27, p. 296). The main textual complication is that Cavendish distinguishes between animal sense and reason, on the one hand, and (e.g.) vegetable, mineral, and elemental varieties of sense and reason, on the other. She thus denies that stones feel pain, for example, but goes on to insist that stones, like everything else, has "sense and reason, according to the nature and propriety of their figure, as well as man has according to his" ([26], Part 2, Letter 20, p. 193). Scholarly consensus on how to understand these passages is a long way off, while [90] joins [91], p. 194 and [89], pp. 22–24 in going so far as to ascribe "consciousness" to all parts of nature, this is plausibly something Cavendish could have said herself if she had wanted to, and she also forbears from calling herself a panpsychist. Against such views, ref. [7] holds that Cavendish thinks much of even human behavior is "unconscious or at least non-conscious" (p. 11). Fortunately, all that will actually matter below is that Cavendish takes parts of nature to be able to resist changes in what they love or what they move in sympathy with, which could be doubted only on interpretations of Cavendish's talk of "sense" and "reason" so deflationary as to render her terminological choices seemingly unmotivated. For very recent, in-depth discussions of the nature and extent of Cavendish's panpsychism, see [92],

which allows that a case for ubiquitous consciousness could be made but remains unusually careful about the distinction between being conscious and merely having "mental capacities" (p. 37), and [93], which characterizes "Cavendishian panpsychism" as "attribut[ing] a mind to all bodies" and "see[ing] each mind as just as mental as every other" (p. 274).

63 See [95] for discussion of Descartes's conception of love in his *Passions of the Soul*, which Cavendish acknowledges having read half of, perhaps in the edition of [96], at [19], "An Epiloge to my Philosophical Opinions", sig. B3v.

64 Cf. [2], p. 69 on "the specious unity" of "the animal-machine and its mechanisms" that is "projected onto it by us when we treat them as if they were human artifacts[.]"

65 This question verges on difficult issues relating to the relationship between freedom and causation, which are still unsettled in the literature. If parts of nature have libertarian freedom, as [8,67,81] have argued, artisans may lack control simply because parts of nature generally lack the power to necessitate other parts of nature to do anything. But I set this aside here to focus on issues relating to artificial production in particular.

66 One referee questions the relevance of this poem, as predating Cavendish's development of her vitalist materialism. First, it is unclear whether the poems of [18] do meaningfully predate her development of vitalist materialism: ref. [82] is a vitalist materialist work, and we know that Cavendish, intending to publish both works together, was hurriedly finishing its composition even as [18] was being printed. Second, Cavendish republished these lines essentially unchanged in subsequent editions of [18] in both 1664 and 1668, i.e., in the midst and at the end of her mature period. Third, as [98], p. 90 notes, Cavendish quotes and endorses her atomist poems in her other serious works as late as 1664, even as she is often thought to have moved decisively beyond them as early as 1655. Fourth, and finally, I know of no textual evidence to suggest that Cavendish's theory of the preferences of oak trees changed meaningfully at any point in her career.

67 Ref. [99] was the first, to my knowledge, to broach an explicitly Bakhtinian analysis of Cavendish's literary output.

68 One anonymous referee challenged the generality of this particular oak tree's preferences, and another observes that Cavendish's system suggests no logical or physical impossibility in the tree's parts voluntarily forming a society with other potential house parts. Nothing injurious to the paper follows from conceding either point. On the first point, there are reasons, connected to Cavendish's mature account of creaturely unity, to defend the generality of the oak tree's desire to continue its treely existence. But Cavendish's poetic conceits are often polysemous, and the oak tree does at certain moments of the poem seem to serve as a stand in for something more specific, viz., a king, perhaps Charles I. On the second point, the referee is straightforwardly correct. If parts of an oak tree experienced passionate love for other potential house parts (and their surroundings either cooperated or were compelled to yield), the resulting house might enjoy full-blown creaturely unity. But the point of the paper, here, is that the unity of an artifact depends in this way on the passions of its parts.

69 On Cavendish's relation to this text, see note 25 above.

70 That is, I take the idea that "sporting or playing" is the relevant alternative to natural love and sympathy to have something to do with Cavendish's conception of specifically male scientific pursuits. Cf. [46,47].

71 Note that even on David Cunning's determinist intepretation of Cavendish ([7,100,101]), parts retain enough freedom of consciousness to resent how they have been constrained by the plenum, and to freely imagine different circumstances.

72 See notes 7 and 25 above for some speculations. Readers may also favorably compare the depth of Cavendish's philosophical knowledge, as implicated in this paper, with the contention of [103] that Cavendish read "widely, if not deeply" (p. 2).

References

1. Shapin, S. *The Scientific Revolution*; University of Chicago Press: Chicago, IL, USA, 1996.
2. Des Chene, D. *Spirits & Clocks: Machine & Organism in Descartes*; Cornell University Press: Ithaca, NY, USA, 2001.
3. Sangiacomo, A. Modelling the history of early modern natural philosophy: The fate of the art-nature distinction in the Dutch universities. *BJHP* **2019**, *27*, 46–74. [CrossRef]
4. James, S. The Philosophical Innovations of Margaret Cavendish. *BJHP* **1999**, *7*, 219–244. [CrossRef] [PubMed]
5. Marshall, G. Margaret Cavendish (1623–1673). Internet Encyclopedia of Philosophy. Available online: https://iep.utm.edu/margaret-cavendish/ (accessed on 22 September 2022).
6. Cunning, D. Cavendish on the Intelligibility of the Prospect of Thinking Matter. *HPQ* **2006**, *23*, 117–136.
7. Cunning, D. *Cavendish*; Routledge: New York, NY, USA, 2016.
8. Detlefsen, K. Reason and Freedom: Margaret Cavendish on the Order and Disorder of Nature. *AGP* **2007**, *89*, 157–191. [CrossRef]
9. Wilson, C. Two Opponents of Material Atomism: Cavendish and Leibniz. In *Leibniz and the English-Speaking World*; Phemister, P., Brown, S., Eds.; Springer: Dordrecht, The Netherlands, 2007; pp. 35–50.
10. Duncan, S. Debating Materialism: Cavendish, Hobbes, and More. *HPQ* **2012**, *29*, 391–409.
11. Goldberg, B. Epigenesis and the Rationality of Nature in William Harvey and Margaret Cavendish. *Hist. Philos. Life Sci.* **2017**, *39*, 1–23. [CrossRef] [PubMed]
12. Des Chene, D. *Physiologia: Natural Philosophy in Late Aristotelian and Cartesian Thought*; Cornell University Press: Ithaca, NY, USA, 1996.
13. Rozemond, M. *Descartes's Dualism*; Harvard University Press: Cambridge, MA, USA, 1998.
14. Leijenhorst, C. *The Mechanization of Aristotelianism: The Late Aristotelian Setting of Thomas Hobbes' Natural Philosophy*; Brill: Leiden, The Netherlands, 2002.
15. Hattab, H. *Descartes on Forms and Mechanisms*; Cambridge University Press: Cambridge, UK, 2009.

16. Schmaltz, T. *The Metaphysics of the Material World: Suárez, Descartes, Spinoza*; Oxford University Press: Oxford, UK, 2020.
17. Cavendish, M. *The Life of William Cavendish, Duke of Newcastle, to Which Is Added the True Relation of My Birth, Breeding, and Life*; John C. Nimmo: London, UK, 1886.
18. Cavendish, M. *Poems and Fancies*; T.R. for J. Martin, and J. Allestrye: London, UK, 1653.
19. Cavendish, M. *The Philosophical and Physical Opinions*; J. Martin and J. Allestrye: London, UK, 1655.
20. Semler, L.E. The Magnetic Attraction of Margaret Cavendish and Walter Charleton. In *Early Modern Englishwomen Testing Ideas*; Wallwork, J., Salzman, P., Eds.; Ashgate Publishing: Burlington, MA, USA, 2011; pp. 55–72.
21. Semler, L.E. Margaret Cavendish's Early Engagement with Descartes and Hobbes: Philosophical Revisitation and Poetic Selection. *IHR* **2012**, *22*, 327–353. [CrossRef]
22. Semler, L.E. Stories of Selves and Infidels: Walter Charleton's Letter to Margaret Cavendish (1655). In *Storytelling: Critical and Creative Approaches*; Shaw, J., Kelly, P., Semler, L.E., Eds.; Palgrave Macmillan: New York, NY, USA, 2013; pp. 191–210.
23. Begley, J. Margaret Cavendish, The Last Natural Philosopher. Ph.D. Thesis, Oxford University, Oxford, UK, 2016.
24. Sheehan, R.J.; Tillery, D. Margaret Cavendish, Natural Philosopher: Negotiating between Metaphors of the Old and New Sciences. In *Eighteenth-Century Women: Studies in Their Lives, Work, and Culture*; Troost, L.V., Ed.; AMS Press, Inc.: New York, NY, USA, 2001; Volume 1, pp. 1–18.
25. Cavendish, M. *Observations upon Experimental Philosophy*; O'Neill, E., Ed.; Cambridge University Press: Cambridge, UK, 2001.
26. Cavendish, M. *Philosophical Letters: Or, Modest Reflections upon Some Opinions in Natural Philosophy, Maintained by Several Famous and Learned Authors of This Age, Expressed by Way of Letters*; William Wilson: London, UK, 1664.
27. Chamberlain, C. Color in a Material World: Margaret Cavendish against the Early Modern Mechanists. *PhilRev* **2019**, *128*, 293–336. [CrossRef]
28. Chao, T. "Between Nature and Art"—The Alchemical Underpinnings of Margaret Cavendish's *Observations upon Experimental Philosophy* and *The Blazing World*. *EurAmerica* **2012**, *42*, 45–82.
29. Dear, P. A Philosophical Duchess: Understanding Margaret Cavendish and the Royal Society. In *Science, Literature and Rhetoric in Early Modern England*; Cummins, J., Burchell, D., Eds.; Ashgate Publishing: Burlington, MA, USA, 2007; pp. 125–142.
30. Sarasohn, L.T. *The Natural Philosophy of Margaret Cavendish: Reason and Fancy during the Scientific Revolution*; The Johns Hopkins University Press: Baltimore, MD, USA, 2010.
31. O'Neill, E. Margaret Cavendish, Stoic Antecedent Causes, and Early Modern Occasional Causes. *Revue philosophique de la France et de l'étranger* **2013**, *138*, 311–326. [CrossRef]
32. Aristotle. *The Complete Works of Aristotle: The Revised Oxford Translation*; Barnes, J., Ed.; Princeton University Press: Princeton, NJ, USA, 1984; Volume 1–2.
33. Descartes, R. *Oeuvres de Descartes: Principia Philosophiae*; Adam, C.; Tannery, P., Eds.; Léopold Cerf: Paris, France, 1905; Volume 8.
34. Descartes, R. *The Philosophical Writings of Descartes*; Cottingham, J.; Stoothoff, R.; Murdoch, D., Trans.; Cambridge University Press: Cambridge, UK, 1985; Volume 1.
35. Hobbes, T. *Elements of Philosophy, The First Section, Concerning Body*; R. & W. Leybourn, for Andrew Crooke: London, UK, 1656.
36. Locke, J. Elements of Natural Philosophy. In *A Collection of Several Pieces of Mr. John Locke, Never before Printed, or Not Extant in His Works*; Des Maizeaux, P., Ed.; J. Bettenham: London, UK, 1720; pp. 179–230.
37. Cook, M.G. Divine Artifice and Natural Mechanism: Robert Boyle's Mechanical Philosophy of Nature. *Osiris* **2001**, *16*, 133–150. [CrossRef]
38. Breen, K. *Machines of the Mind: Personification in Medieval Literature*; University of Chicago Press: Chicago, IL, USA, 2021.
39. Berryman, S. Ancient Automata and Mechanical Explanation. *Phronesis* **2003**, *48*, 344–369. [CrossRef]
40. Berryman, S. *The Mechanical Hypothesis in Ancient Greek Natural Philosophy*; Cambridge University Press: Cambridge, UK, 2009.
41. Fricke, B. *Artifex* and *Opifex*—The Medieval Artist. In *A Companion to Medieval Art: Romanesque and Gothic in Northern Europe*, 2nd ed.; Rudolph, C., Ed.; Wiley Blackwell: Hoboken, NJ, USA, 2019; pp. 45–69.
42. O'Neill, E. Introduction. In *Observations upon Experimental Philosophy*; O'Neill, E., Ed.; Cambridge University Press: Cambridge, UK, 2001; pp. x–xxxvi.
43. Shaheen, J. L. Part of nature and division in Cavendish's materialism. *Synthese* **2019**, *196*, 3551–3575. [CrossRef]
44. Power, H. *Experimental Philosophy, In Three Books: Containing New Experiments Microscopical, Mercurial, Magnetical*; T. Roycroft for John Martin and James Allestry: London, UK, 1664.
45. Cavendish, M. *Grounds of Natural Philosophy: Divided into Thirteen Parts: With an Appendix Containing Five Parts*; A. Maxwell: London, UK, 1668.
46. Smith, H. L. Margaret Cavendish and the Microscope as Play. In *Men, Women, and the Birthing of Modern Science*; Zinsser, J., Ed.; Northern Illinois Press: Dekalb, IL, USA, 2005; pp. 35–47.
47. Lascano, M.P. Margaret Cavendish and the New Science: "Boys that play with watery bubbles or fling dust into each other's eyes, or make a hobbyhorse of snow". In *The Routledge Handbook of Feminist Philosophy of Science*; Crasnow, S., Intemann, K., Eds.; Routledge: New York, NY, USA, 2020; pp. 28–40.
48. Cameron, M. The Moving Cause of Artefacts: The role of *techne* in metaphysical explanation. *Anc. Philos. Today DIALOGOI* **2019**, *1*, 64–83. [CrossRef]
49. Lascano, M.P. Cavendish and Hobbes on Causation. In *A Companion to Hobbes*; Adams, M. P., Ed.; Wiley-Blackwell: New York, NY, USA, 2021; pp. 413–430.
50. Stanley, T. *The History of Philosophy, The Second Volume*; Humphrey Moseley and Thomas Dring: London, UK, 1656.

51. Havers, G. *A General Collection of Discourses of the Virtuosi of France, Upon Questions of all Sorts of Philosophy, and Other Natural Knowledg*; Thomas Dring and John Starkey: London, UK, 1664.
52. Charleton, W. *Physiologia Epicuro-Gassendo-Charltoniana: Or A Fabrick of Science Natural upon the Hypothesis of Atoms*; Tho. Newcomb: London, UK, 1654.
53. Cavendish, M. *Political Writings*; James, S., Ed.; Cambridge University Press: Cambridge, UK, 2003.
54. Van Helmont, J.B. *Oriatrike or, Physick Refined*; Lodowick Loyd: London, UK, 1662.
55. Cavendish, M. *Philosophical and Physical Opinions*; William Wilson: London, UK, 1663.
56. Clucas, S. Variation, Irregularity and Probabilism: Margaret Cavendish and Natural Philosophy as Rhetoric. In *A Princely Brave Woman: Essays on Margaret Cavendish, Duchess of Newcastle*; Clucas, S., Ed.; Ashgate Publishing: Burlington, MA, USA, 2003; pp. 199–209.
57. Cavendish, M. *The Worlds Olio*; J. Martin and J. Allestrye: London, UK, 1655.
58. Boyle, D. Margaret Cavendish on Perception, Self-Knowledge, and Probable Opinion. *Philos. Compass* **2015**, *10*, 438–450. [CrossRef]
59. Hamou, P. Marin Mersenne. *SEP* **2018**, *2018*.
60. Galilei, G. De Motu. In *Le Opere di Galileo Galilei: Edizione Nazionale*; Favaro, A., Ed.; G. Barbèra: Florence, Italy, 1890; Volume 1, pp. 243–419.
61. Westfall, R.S. *Force in Newton's Physics: The Science of Dynamics in the Seventeenth Century*; Science History Publications: New York, NY, USA, 1971.
62. Baldin, G. *Hobbes and Galileo: Method, Matter and the Science of Motion*; Springer: Cham, Switzerland, 2020.
63. Joakim, S.; Ragland, C.P. Is Hobbes Really an Antirealist about Accidents? *EJAP* **2018**, *14*, 11–25. [CrossRef]
64. Horstmann, F. Hobbes on Hypotheses in Natural Philosophy. *Monist* **2001**, *84*, 487–501. [CrossRef]
65. Mersenne, M. Nouvelles Observations Physiques et Mathematiques. In *Seconde Partie De L'Harmonie Universelle*; Mersenne, M., Ed.; Pierre Ballard: Paris, France, 1637; pp. 1–28.
66. Pelletier, J. Getting Real: Ockham on the Human Contribution to the Nature and Production of Artifacts. *Philosophies* **2022**, *7*, 90. [CrossRef]
67. Boyle, D. *The Well-Ordered Universe: The Philosophy of Margaret Cavendish*; Oxford University Press: Oxford, UK, 2018.
68. Borcherding, J. XV—'I Wish My Speech Were Like A Loadstone': Cavendish on Love and Self-Love. *Proc. Arist. Soc* **2021**, *121*, 381–409. [CrossRef]
69. Peterman, A. Margaret Cavendish on Motion and Mereology. *JHP* **2019**, *57*, 467–496. [CrossRef]
70. Zupko, J. "Nothing in Nature Is Naturally a Statue": William of Ockham on Artifacts. *Metaphysics* **2018**, *1*, 88–96. [CrossRef]
71. Boyle, R. *The Origine of Formes and Qualities, (According to the Corpuscular Philosophy,) Illustrated by Considerations and Experiments*; H. Hall, for Ric: Davis: Oxford, UK, 1666.
72. Henry, D.P. *Medieval Mereology*; B. R. Grüner Publishing Co.: Amsterdam, The Netherlands, 1991.
73. Bakker, P. John Buridan on the Ontological Status of Artifacts: Readings from his Commentaries on Aristotle's Physics. In Proceedings of the Lomonsov-Radboud Colloquium on Medieval Logic, Metaphysics, and Science: Texts and Problems, Radboud, NL, USA, 10 November 2021.
74. Georgescu, L. Bodies and Their Potential Parts: The Not-So-Friendly Reception of Digbean Quantity. In *The Philosophy of Kenelm Digby (1603–1665)*; Georgescu, L., Adriaenssen, H.T., Eds.; Springer: Cham, Switzerland, 2022; pp. 223–246.
75. Digby, K. *Two Treatises in the One of Which, The Nature of Bodies; in the Other, The Nature of Mans Soule; Is Looked Into: In Way of Discovery, of the Immortality of Reasonable Soules*; Gilles Blaizot: Paris, France, 1644.
76. Pasnau, R. *Metaphysical Themes: 1274–1671*; Oxford University Press: Oxford, UK, 2011.
77. Majcherek, K. Paul of Venice's metaphysics of artefacts. *BJHP* **2020**, *28*, 29–48. [CrossRef]
78. Adams, M.P. Motion as an Accident of Matter: Margaret Cavendish and Thomas Hobbes on Motion and Rest. *South. J. Philos.* **2021**, *59*, 495–522. [CrossRef]
79. James, S. 'Hermaphroditical Mixtures': Margaret Cavendish on Nature and Art. In *Early Modern Women on Metaphysics*; Thomas, E., Ed.; Cambridge University Press: Cambridge, UK, 2018; pp. 31–48.
80. Lascano, M.P. The Power of Self-Motion in Cavendish's Nature. In *Powers: A History*; Jorati, J., Ed.; Oxford University Press: Oxford, UK, 2021; pp. 169–188.
81. Detlefsen, K. Atomism, Monism, and Causation in the Natural Philosophy of Margaret Cavendish. In *Oxford Studies in Early Modern Philosophy*; Garber, D., Nadler, S., Eds.; Oxford University Press: Oxford, UK, 2006; Volume 3, pp. 199–240.
82. Cavendish, M. *Philosophicall Fancies*; Tho: Roycroft, for J. Martin, and J. Allestrye: London, UK, 1653.
83. Broad, J. Margaret Cavendish and Joseph Glanvill: Science, religion, and witchcraft. *Stud. Hist. Phil. Sci.* **2007**, *38*, 493–505. [CrossRef]
84. Broad, J. Is Margaret Cavendish worthy of study today? *Stud. Hist. Philos. Sci. Part A* **2011**, *42*, 457–461. [CrossRef]
85. Broad, J.; Sipowicz, M. Cavendish's Philosophy of the Passions: Theory and Practice. In *Margaret Cavendish: An Interdisciplinary Perspective*; Walters, L., Siegfried, B.R., Eds.; Cambridge University Press: Cambridge, UK, 2022; pp. 83–97.
86. Duncan, S. Margaret Cavendish, Environmental Ethics, and Panpsychism. Available online: https://philarchive.org/rec/DUNMCE (accessed on 3 October 2022).

87. Hustvedt, S. Afterword: Margaret Cavendish: A Grandmother for Twenty-First Century Philosophy of Science. In *Margaret Cavendish: An Interdisciplinary Perspective*; Walters, L., Siegfried, B.R., Eds.; Cambridge University Press: Cambridge, UK, 2022; pp. 274–288.
88. Merchant, C. Margaret Cavendish: Natural Philosopher and Feminist. In *Margaret Cavendish: An Interdisciplinary Perspective*; Walters, L., Siegfried, B.R., Eds.; Cambridge University Press: Cambridge, UK, 2022; pp. 19–32.
89. Thell, A.M. (Ed.) Introduction. In Cavendish, M. *Grounds of Natural Philosophy*; Broadview Press: Petersborough, ON, Canada, 2020; pp. 11–41.
90. Shaheen, J.L. The Life of the Thrice Sensitive, Rational and Wise Animate Matter: Cavendish's Animism. *HOPOS* **2021**, *11*, 621–641. [CrossRef]
91. Rogers, J. *The Matter of Revolution: Science, Poetry, and Politics in the Age of Milton*; Cornell University Press: Ithaca, NY, USA, 1996.
92. Branscum, O. Recovering Matter's "Most Noble Attribute": Panpsychist-Materialist Monism in Margaret Cavendish, Anne Conway, and 17th-Century English Thought. Ph.D. Thesis, Columbia University, New York, NY, USA, 2022.
93. McWeeny, J. Which Bodies Have Minds? Feminism, Panpsychism, and the Attribution Question. In *Feminist Philosophy of Mind*; Maitra, K., McWeeny, J., Eds.; Oxford University Press: Oxford, UK, 2022; pp. 272–293.
94. Brown, D.J.; Normore, C.G. *Descartes and the Ontology of Everyday Life*; Oxford University Press: Oxford, UK, 2019.
95. Frigo, A. A very obscure definition: Descartes's account of love in the *Passions of the Soul* and its scholastic background. *BJHP* **2016**, *24*, 1097–1116. [CrossRef]
96. Des Cartes, R. *The Passions of the Soule in Three Books*; A.C.: London, UK, 1650.
97. Sperber, D. Seedless Grapes: Nature and Culture. In *Creations of the Mind: Theories of Artifacts and Their Representation*; Margolis, E., Laurence, S. Eds.; Oxford University Press: Oxford, UK, 2007; pp. 124–137.
98. Walters, L. *Margaret Cavendish: Gender, Science and Politics*; Cambridge University Press: Cambridge, UK, 2014.
99. Freidl, H. Creatoress, Duchess, Empress—A Narratological Mess: Problems of Discourse and Implied Worldview in Cavendish's *Description of the Blazing World*. In Proceedings of the 13th International Margaret Cavendish Society Conference, Trondheim, Norway, 6 June 2019.
100. Cunning, D. Margaret Cavendish on the Imagination and the Dramatic Force of the Imaginary World. In *Early Modern Women on Metaphysics*; Thomas, E., Ed.; Cambridge University Press: Cambridge, UK, 2018; pp. 188–210.
101. Cunning, D. Cavendish on Material Causation and Cognition. In *Causation and Cognition in Early Modern Philosophy*; Perler, D., Bender, S., Eds.; Routledge: New York, NY, USA, 2020; pp. 145–170.
102. Cavendish, M. *A Collection of Letters and Poems: Written by Several Persons of Honour and Learning, Upon Divers Important Subjects, to the Late Duke and Dutchess of New Castle*; Langly Curtis: London, UK, 1678.
103. Dodds, L. *The Literary Invention of Margaret Cavendish*; Duquesne University Press: Pittsburgh, PA, USA, 2013.