

LEIBNIZ'S MILL ARGUMENT AGAINST MECHANICAL MATERIALISM REVISITED

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Section 17 of Leibniz's *Monadology* contains a famous argument in which considerations of what it would be like to enter a machine that was as large as a mill are offered as reasons to reject materialism about the mental. In this paper, I provide a critical discussion of Leibniz's *mill argument*, but, unlike most treatments, my discussion will focus on texts other than the *Monadology* in which considerations of the mill also appear. My aim is to provide a survey of three previous interpretations of the argument and to provide a partial defence of one of them, namely the one that Marc Bobro and I offered in another paper. However, I shall also argue that a fourth interpretation is necessary to account for the appearances of Leibniz's mill in at least some of his writings.

1. Introduction

In Section 17 of the *Monadology* Leibniz presents an argument that is concerned with the relationship between mentality and machines. This passage is often referred to as Leibniz's *mill argument*. It runs as follows:

[W]e must confess that perception, and what depends upon it, is inexplicable in terms of mechanical reasons, that is through shapes, size, and motions. If we imagine a machine whose structure makes it think, sense, and have perceptions, we could conceive it enlarged, keeping the same proportions, so that we could enter into it, as one enters a mill. Assuming that, when inspecting its interior, we will find only parts that push one another, and we will never find anything to explain a perception. And so, one should seek perception in the simple substance and not in the composite or in the machine. (GP: VI, 609/AG: 215)

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Here Leibniz begins with the claim that “perception and what depends on it, is inexplicable in terms of mechanical reasons, that is shapes, size, and motions”, and he concludes that we should “seek perception in the simple substance and not in the composite or in the machine.” In between, he includes a famous thought experiment that adverts to considerations of the relationship between an imagined perceiving, sensing, thinking machine and a much larger machine (as large as a mill) that shares the same mechanical structure.

My aim in the present paper is to provide a critical survey of three previous interpretations of the mill argument and to introduce a new one. My discussion will be complicated by the fact that I will focus on texts other than Section 17 of the *Monadology* in which considerations of the mill also appear.¹ Part of my aim will be to offer a partial defence of an interpretation that Marc Bobro and I have presented elsewhere of the argument as it appears in the *Monadology*. However, I shall also claim that a fourth interpretation is necessary to account for the other appearances of Leibniz’s mill.²

2. Preliminary Considerations

Before moving to the different interpretations of Leibniz’s mill argument, it is important to turn to some preliminary considerations. The first thing to note is that the conclusion of Section 17 should not be read in isolation from the preceding sections of the *Monadology*. When the conclusion is read in its context, it becomes apparent that the argument occurs against a backdrop where simple substances and machines have been offered by Leibniz as the only candidate loci for perception.³ In light of this we can see something that is borne out by the other passages in which the mill appears, namely that Section 17 is not supposed to establish the positive claim that perception should be sought in simple substances, but merely that it should not be sought in “the composite or in the machine”.

A second consideration arises when we turn to some of the other mill passages. Two of these, from the Preface to the *New Essays on Human Understanding* and a letter to Bayle probably dating from 1702, appear as responses to claims from

1. Attention is drawn to the existence of some (though not all) of these other passages, for the first time that I am aware of, in a recent paper by Stewart Duncan (2012). It is worth noting that Leibniz talks about other machines in some of these passages, such as watches and clocks.

2. In claiming that the mill argument must be interpreted in two distinct ways, I am in agreement with Stewart Duncan. However, as will become clear below, with the exception of one passage, we do not agree on the interpretations in question. Since writing this paper, it has come to my attention that the fourth interpretation that I shall discuss has also been identified and discussed by Marleen Rozemond (2014).

3. See Duncan (2012: 267–268).

Locke and Toland respectively regarding the possibility of thinking matter.⁴ Here it should be noted that Leibniz's vacillation between talk of machines in the *Monadology* and talk of matter in these other texts is of no great significance. The key to understanding this is to recognize that Leibniz directs all the instances of the mill argument toward people who regard material things as mechanical systems, i.e., as entities whose behaviour can be accurately and exhaustively explained by adverting to nothing other than the sizes and shapes of impenetrable particles that have the power to receive motion from other particles through impact or as a result of the direct activity of immaterial entities upon them.⁵ This is evident in the passage from the Preface to the *New Essays*, but Leibniz is even more explicit when he returns to the question of whether matter can think in Book 4 of this work, pointing out that he is concerned with "matter considered as wholly mechanical" (NE: 379).⁶ In order to keep this fact in mind, I shall talk of *mechanical matter* and *mechanical materialism* from now on.

Finally, we need to be aware that Leibniz is not entirely consistent in his description of what it is that cannot be explained mechanically, and by extension, what it is that he thinks matter is incapable of. For example, in the *Monadology*, it is "perception and what depends on it", where "what depends on it" seems to refer to thinking and sensing. But in the Preface to the *New Essays* (NE: 66), "sense and thought" are under discussion, with no mention of perception at all.⁷

With these considerations in mind, it is possible to distill a generic mill argument from all the passages in which it occurs. Leibniz begins with the premise that perception and/or sensation and thought are inexplicable in mechanical terms and concludes that mechanical matter is not something that has the capacity to perceive and/or sense and think. What of the mill? Its role is to highlight, and make more transparent, the nature of the explanatory resources available to mechanical materialism. Notably, once the mill is seen in this way, we can also appreciate that its inclusion is far from essential. Leibniz's argument relies on an understanding of

4. See NE (66) and GP: III, 68/WF: 129.

5. Whilst it might seem odd to call some material things (e.g., stones) machines, it seems reasonable to refer to the relevant material things (i.e., brains) in this way.

6. This notion of matter conforms, for example, to the idea of matter presented by Locke in the essay (see Echu 2.23.15, A section of the *Essay* to which Leibniz explicitly refers at NE: 62), which is said to be formed "by putting together the *Ideas* of coherent solid parts and a power of being moved, joined with Substance . . . we have the *Idea* of matter". Furthermore, it is the idea of extended, passive, impenetrable, mobile stuff that Leibniz refers to as "the common conception of matter" (LDV: 3; also see LDV: 101, 211, 259) and that he explicitly attributes to the Cartesians (for example, see LDV: 225, 241) as well as to Hobbes and Toland (Leibniz's attribution of this view to Toland occurs in the letter to Sophie from mid-September 1702, where he also attributes it to Hobbes; see Klopp: VIII, 364/LTS: 293).

7. Notwithstanding this, we should not lose sight of the fact that the passage from the *Monadology* does suggest that, for Leibniz, any consideration that is supposed to tell against the explicability of perception in mechanical terms will also tell against sensation and thought.

what mechanical matter is and is capable of, rather than on anything that is true of mills. Thus, consideration of the mill itself does not provide us with any additional premises for Leibniz's anti-materialist arguments, and further discussion of it will be largely absent from the remainder of this paper.

3. Four Interpretations of Leibniz's Mill Argument

Having offered an initial characterization of Leibniz's mill argument, I now want to consider why Leibniz thought the premise was true and how he thought it licensed his conclusion. Neither of these two points is immediately apparent in the passages in which the mill appears. Indeed, I shall argue that, when properly contextualized, we should think of Leibniz as employing two distinct argumentative strategies to link the inexplicability of perception, sensation, and thought with the claim that mechanical materialism is false. But, in order to argue for this thesis, I shall also consider two additional interpretations, which I think we should probably reject.⁸

The differences between the interpretations that I want to consider all turn on Leibniz's grounds for accepting his premise. Commentators have given little attention to the basis for his inference, but it is worth turning to it briefly. Leibniz argues from the claim that perception and/or sensation and thought cannot be explained in terms of the features that accurately and exhaustively characterize mechanical matter and its behaviour to the conclusion that they are not properties of mechanical material things. This inference is grounded in a principle that we find very early in Leibniz's writings, and that he reiterated publicly in the early 1690s. Thus, in 1669, in a letter to Thomasiaus, Leibniz was prepared to assert that "bodies must not be assumed to possess any properties the cause of which cannot be derived from their essence" (A II.i: 23/L: 101–102), and in a letter to the editor published in the *Journal des Savants* of 1691, Leibniz is even more explicit: "If the essence of body consisted in extension, this extension ought to be sufficient on its own to account for all the features of body" (GP: IV, 464/PWL: 42). The features that figure in mechanical explanations exhaust those that Leibniz thinks can be derived from the essence of mechanical matter, and it therefore follows for him that were perception, sensation, and thought to be properties of a mechanical material thing then they ought to be intelligible in these terms. With this commitment in place, the inference we are considering is secure.

One could clearly question the principle that Leibniz invokes here. However,

8. Given that its proponents provide no basis for their interpretation in the text itself, I will not discuss a fifth strategy, which can be found in the writings of Rorty (1979: 26–27) and Churchland (1995: 191–192), according to which Leibniz's mill argument turns on the claim that mental states are not observed in the mill. For further discussion, see Lodge and Bobro (1998: 554–555).

it is reasonable to think that most of his opponents would have been content with it. It is, for example, this kind of commitment that underwrites the conception of body that Descartes outlines in section 53 of Part I of the *Principles of Philosophy* (AT: VIIIA, 25/CSM: I, 210–11) and that the Cartesian Burcher de Volder explicitly brought to his correspondence with Leibniz when seeking an explanation of how it was that Leibniz understood his (Leibniz's) claim that matter is naturally active.⁹ An important exception in this regard is Locke, who at least entertained the view that matter might think as a result of divine supperaddition of power of thinking.¹⁰ But even in this case, Locke seems to have accepted the principle with regard to the natural properties of body.

Having briefly considered the grounds for Leibniz's inference, I now want to turn to the premise. In other words, I want to consider why it was that Leibniz thought his readers should accept that perception, sensation, and thought are inexplicable in mechanical terms.

3.1 Mechanical Explanation and the Explanatory Gap

Focusing on the mill passage from the Preface to the *New Essays*, Stewart Duncan argues that, in the *Monadology* and *New Essays*, Leibniz supports the premise by “trying to persuade [the reader] that . . . materialism is false using an intuition about inexplicability: ‘One cannot conceive . . . So . . .’” (2012: 258). The strategy that Duncan attributes to Leibniz is one that is familiar from recent discussions concerning the metaphysics of mind. Leibniz is represented as trying to get the reader to accept that consideration of the explanatory resources that mechanical materialism offers leaves one unable to see how there could be a way to develop an explanation of how such a system might perceive, sense, or think.¹¹ Importantly, Duncan's Leibniz does not offer any positive characterization of the explanandum when making the claim about inconceivability. The only contribution that the terms *perception*, *sensation*, and *thought* make to the argument is to indicate phenomena to which readers should attend so that they will acknowledge the existence of an unclosable explanatory gap and agree that those phenomena are inexplicable in mechanical terms.

One obvious concern about attributing this explanatory-gap interpretation to Leibniz is that it leaves him open to the charge that the inexplicability of perception, sensation, and thought may be merely apparent. Duncan is sensitive to this, but presents evidence that Leibniz regarded some instances of inconceivability as

9. See LDV (xlvi).

10. See the discussion at ECHU (4.3.6).

11. It is perhaps not surprising, then, to find that this interpretation has been presented in works that are primarily concerned with contemporary accounts of materialism about the mental, e.g., Searle (1983: 267–268) and Heil (1992: 129–130).

providing grounds for claims about what is possible, and hence about what is actually the case. In light of this, he points out that whilst Leibniz says that “we must not deny what we do not understand,” he also claims that “we are entitled to deny (within the natural order at least) whatever is absolutely unintelligible and inexplicable” (NE: 65). Duncan also draws attention to the fact that Leibniz says a little more about what would be required for there to be an intelligible account of the relationship between a feature, or modification, of something and that thing, namely that the modification “must arise from limitations and variations of a real genus, i.e. of a constant and absolute inherent nature” (NE: 65). Thus, Duncan’s reading of the argument of the Preface can be recast in the following way: The modifications of mechanical matter are exhausted by the size, shape, and motion, and their mechanical combinations. Conceiving of the nature of these modifications and their combinations (aided by the mill) leaves us unable to see how they might provide the basis for an explanation of perception, sensation, and thought. From this, we can infer that perception, sensation, and thought are inexplicable in mechanical terms and, ultimately, that they are not modifications of mechanical matter.

Despite these claims, Duncan still recognizes a *prima facie* problem with interpreting Leibniz in this way. He notes that, whilst Leibniz provides some positive instances of intelligible modifications, such as the shape of a body being a limitation of its nature, i.e., extension, he (Leibniz) does not provide general criteria for determining when something is of this kind. Thus, Leibniz still leaves himself open to a version of the original worry that any given claim of unintelligibility may be an instance of something “we do not understand”, rather than something “absolutely unintelligible and inexplicable.” For even if we accept that Leibniz is right in claiming that we cannot conceive how mechanical features might combine in order to give rise to perception, sensation, and thought, why should we infer that it is genuinely *inconceivable*, i.e., that there could *never* be a way of conceiving of the relationship between mechanical matter and perception, sensation, and thought that was explanatory?¹²

These considerations notwithstanding, Duncan still regards his interpretation as the best reading of the mill argument in the Preface to the *New Essays* and Section 17 of the *Monadology*. The main reason for this is that Leibniz says very little in these passages beyond drawing attention to the inexplicability of certain aspects of mentality.¹³ As we have seen, in the latter, Leibniz begins with the claim that “we must confess that perception, and what depends upon it, is inexplicable in terms

12. See Duncan (2012: 257–258).

13. Duncan (2012: 266–268). Duncan also supports his interpretation of the mill argument in the *New Essays* by drawing attention to Leibniz’s rejection of Newtonian gravity in a passage that comes shortly before the mill argument and arguing that this argument evidently has the form that

of mechanical reasons" (GP: VI, 609/AG: 215) and then moves on to the mill. But, although the mill provides a vivid example of a mechanical system at work, its introduction is not accompanied by an explanation of why a machine could not perceive or have the other features that are said to depend on perception. And the passage from the Preface to the *New Essays* simply runs as follows:

As for thought, it is certain, as our author more than once acknowledges, that it cannot be an intelligible modification of matter and be comprehensible and explicable in terms of it. That is, a sentient or thinking being is not a mechanical thing like a watch or a mill: one cannot conceive of sizes and shapes and motions combining mechanically to produce something which thinks, and senses too, in a mass where [formerly] there was nothing of the kind – something which would likewise be extinguished by the machine's going out of order. So sense and thought are not something which is natural to matter[.] (NE: 66–67)

Duncan draws attention to an important feature of almost all of the places in which Leibniz discusses the mill, namely, that he is frustratingly vague about what his reasoning might be. And this clearly invites the thought that it should be understood in the minimal way that Duncan suggests. However, there is textual evidence that we should look for something more inflated. Of most significance here is Leibniz's *Reply to Bayle*, written in 1702 (i.e., around the same time as the letter to Bayle that includes the mill), in which he expresses the view that arguments based on inexplicability require a positive ground. Thus, he writes: "It is no proof of the impossibility of something merely to say that one cannot conceive this or that, when one doesn't make clear where it conflicts with reason, and when the difficulty is only one of imagination, and not of understanding" (GP: IV, 565/ WF: 119). There is reason then to look for ways in which Leibniz might support the premise of the mill argument by articulating his conceptions of the explananda in such a way that claiming that they are explicable in mechanical terms "conflicts with reason."

The three remaining interpretations that I wish to consider all have this desired form. I shall argue below that two of the three have some plausibility. But there are important caveats. I think there is evidence that Leibniz explicitly employed the third of these lines of reasoning in some of the passages in which he presents the mill and argues against mechanical materialism. However, this interpretation does not seem to account for what is going on in the *Monadology*, and its presence in

he sees as present in the mill argument (Duncan 2012: 261–263). As will become clear below, I do not think that this second reason is compelling.

the Preface to the *New Essays* is certainly open to question. Furthermore, whilst I still wish to suggest that Bobro and I were right to think that the second of the remaining interpretations provides a plausible way of thinking about Section 17 of the *Monadology* and the letter to Bayle from 1702, I now think that the case for this reading was overstated in our previous discussion.

3.2 *Mechanical Explanation and the Unity of Perceptual Consciousness*

The first interpretation that I want to discuss is due to Margaret Wilson, who offers it as part of an analysis that is intended to provide an interpretation of Section 17 of the *Monadology*. She writes:

[E]vidence from both the “Monadology” context and Leibniz’s other writings suggests that what he regards as not susceptible of mechanistic explanation is, more immediately, the “unity” of perceptual consciousness, or what he calls the “true unity” designated by “I”. (1999: 396)¹⁴

Wilson’s suggestion is that when Leibniz talks of the inexplicability of perception in the *Monadology*, he is really concerned with the inexplicability of “the unity of perceptual consciousness”. She elaborates the idea as follows:

[Leibniz’s] point, very roughly seems to be that a materialist explanation of perception is impossible because perception does essentially involve the “true unity” of the perceiving self, while material mechanisms are always divisible into parts. What will be missing in the observer’s description of any hypothetically perception-producing machine is just the essential “unity” of consciousness or anything from which an understanding of that could be derived. (1999: 397)

Although Wilson’s understanding of the expression “‘unity’ of consciousness” is crucial here, she does not provide any further elaboration when she introduces her reading. However, considerations toward the end of her article suggest she is thinking of a kind of unity that is intrinsic to conscious sensory perception, *qua* conscious.¹⁵ For here she claims that contemporary materialists who locate the experiences associated with each of the sensory modalities in different parts of the

14. Also see Seager (1991: 174).

15. For this reading of Wilson, see Lodge and Bobro (1998: 558–561) and Duncan (2012: 268–269).

brain will face a problem similar to the one raised by Leibniz in that they will “not have explicated the fact that seeing-green-and-smelling-cabbage is *one* experience with distinguishable components, or in other words, that the sensations belong to one consciousness” (1999: 400).¹⁶

As Bobro and I argued, this reading does not seem plausible.¹⁷ An initial problem is that, at least as far as I am aware, there is no positive textual evidence that Leibniz is concerned with the kind of unity mentioned by Wilson. Moreover, what is said to be inexplicable in Section 17 of the *Monadology*, i.e., perception, is explicated in a way that directly undermines the reading three sections earlier in Section 14 of the same work. Here Leibniz observes that “[t]he passing state which involves and represents a multitude in the unity . . . is nothing other than what one calls perception” (GP: VI, 608/AG: 214).¹⁸ Implicit in this observation is something that is made explicit in *The Principles of Nature and Grace*, which is contemporary with the *Monadology*, namely that conscious awareness is not essential for perception as Leibniz understands it. Leibniz writes in the *Principles*:

It is good to distinguish between a *perception*, which is the internal state of the monad representing external things, and *apperception*, which is *consciousness*, or the reflective knowledge of the internal state, something not given to all souls, nor at all times to a given soul. (GP: VI, 600/AG: 208)¹⁹

Two things are clear here: First, Leibniz does not regard all perception as involving apperception, or as self-conscious perception; and second, Leibniz claims that there are souls that perceive without apperceiving.²⁰ Taken together these considerations strongly suggest that consideration of a unity that is intrinsic to conscious perceptual awareness, *qua* conscious, is unlikely to be that which leads Leibniz to regard perception as inexplicable in mechanical terms.

16. It is noteworthy that Wilson does not discuss sensation or thought. However, it should be remembered that in Section 17 of the *Monadology*, Leibniz says that sensation and thought “depend on” perception. Thus, were this reading a plausible one, it would by extension allow us to see why Leibniz thought that they could not be explained mechanically either.

17. See Lodge and Bobro (1998: 560–561).

18. This account is repeated throughout Leibniz’s writings. For example, see A: VI.i, 286/L: 91, n.16; GP: II, 112/LA: 144; GP: II, 121/LA: 155; GP: II, 311; GP: III, 69/WF: 130; GP: III, 576/L: 662; GP: III, 581/L: 664; GP: VI, 598/L: 536; GP: VII, 317; GP: VII, 529.

19. Also, see NE (134); GP: II, 271/L: 537; GP: IV, 541/L: 588.

20. In the *Considerations on Vital Principles*, Leibniz is even more explicit: “I do not find that the Cartesians have ever proved or ever could prove that all perception is accompanied by consciousness” (GP: VI, 543/L: 588).

3.3 *Mechanical Explanation and the Unity of Perception*

Whilst I have argued that there are problems with Wilson’s focus on the unity of perceptual consciousness, it may already be apparent that her discussion draws attention to aspects of Leibniz’s conception of perception that provide the basis for another reading of Section 17 of the *Monadology*. As we saw, in Section 14 of the *Monadology*, Leibniz characterizes perception as “[t]he passing state which involves and represents a multitude in the unity” (GP: VI, 608/AG: 214). Furthermore, machines are systems comprised of matter that is essentially extended, and, therefore, essentially divisible. Given this, the following grounds for the claim that there could never be a mechanical explanation of perception emerge: Since mechanical explanations always advert solely to properties of an essentially divisible mechanical matter, machines and their properties could never be characterized in such a way that it could be said that the machine is a unity. Thus, no mechanical explanation could capture an essential component of what is required for perception to occur.²¹

This reading is not without its problems, given that Leibniz does not mention unity at all in Section 17. But it still seems to me reasonable to think that it may have been what Leibniz was thinking. For one thing, only three sections earlier we find unity offered as an essential feature of perception; for another, toward the end of Section 17, Leibniz draws attention to the fact that the machine in which “one should not seek perception” is “composite” (GP: VI, 609/AG: 215). Also, it should not be forgotten that the *Monadology* opens, in Section 1, with a definition of the monad as “a simple substance . . . – simple, that is, without parts” (GP: VI, 607/AG: 213). Thus, the resources are readily available in the early parts of the *Monadology* for the reader to understand Section 17 in this way. And, finally, Leibniz offers no explicit alternative.²²

One might at this point fall back on Duncan’s attribution of the inexplicability reading, albeit on pain of ignoring Leibniz’s claim in the *Reply to Bayle* that we need positive reasons to rule out a possibility on the grounds of its being incon-

21. The early part of Wilson’s second quotation above makes precisely this point. However, the remainder of the passage and the rest of her discussion suggests, as I argued above, that her interpretation turns on the claim that it is the unity of apperception rather than the unity of perception that is regarded as inexplicable by Leibniz.

22. This not to say that we as contemporary readers might not be able to come up with alternatives, of course. Thus, Margaret Wilson begins with a brief consideration of the possibility that Leibniz is concerned with the issue of privacy (1999: 396; also see Gunderson 1983: 629). However, she provides no textual evidence at all for this reading, and since the privacy in question involves privileged conscious access, it seems to me to be ruled out by the fact that Leibniz is focused on the inexplicability of perception understood in his own terms. Furthermore, I think the claims that Leibniz might have been interested in things such as the phenomenal character of sensory perception are implausible candidates on these grounds as well.

ceivable by us. Or perhaps one might wish to suggest that we simply do not know what positive reason Leibniz had in mind in *Monadology* Section 17. Both of these options seem compatible with the text of the *Monadology*. Nonetheless, my own inclination is still to think that the unity of perception may well be doing the work.

Further evidence that Leibniz saw the connection between consideration of the mill, the unity of perception, and the rejection of mechanical materialism is offered by Duncan. The evidence in question is found in his letter to Bayle of 1702. In the context of a report of a conversation that Leibniz had had with John Toland about Toland's "claim that matter can become able to think, as it can become round, and thus that a certain organization, or a certain shape, can produce thought, and that when that organization is destroyed, thought will cease" (GP: III, 68/WF: 129), Leibniz tells Bayle:

I took the liberty of telling him that thought seems to be of a completely different kind. Even if we had eyes as penetrating as you like, so as to see the smallest parts of the structure of bodies, I do not see that we would thereby be any further forward. We would find the origin of perception there as little as we find it now in a watch, where the constituent parts of the machine are all visible, or in a mill, where one can even walk around among the wheels. For the difference between a mill and a more refined machine is only a matter of greater and less. We can understand that a machine could produce the most wonderful things in the world, but never that it might perceive them. (ibid.)

And later in the same paragraph Leibniz presents his definition of perception as "*the expression of a multitude in a unity*" (GP: III, 69/WF: 130),²³ making it clear that this is the notion of perception that he has in mind. As Duncan notes, there is nothing so far that provides any real purchase on why it is that Leibniz thinks that we would not find "the origin of perception" in a machine or "never [understand] that it might perceive" (2012: 254). However, the passage continues in ways that suggest to Duncan, and to me, that the unity of perception may have been on Leibniz's mind. Thus, we find:

Among visible things there is nothing which gets nearer to thought than does an image in a mirror (and brain traces could be no more accurate than that is), but the accuracy of that image doesn't produce any perception in the thing it is in. We do not even come close to it, whatever mechanical theory we make up; we remain infinitely far away from it, as must happen with things which are absolutely heterogeneous, just as a surface, when

23. Also see the *New System* (GP: VI, 480/WF: 16).

folded up on itself as often as you like, can never become a body. (GP: III, 68–69/WF: 129)

Here Leibniz suggests that mirrors (and perhaps “brain traces”) have the capacity to produce accurate images of things, and, in so doing, get as close to thought as anything visible could. But they are still said to be “infinitely far away from” and “absolutely heterogeneous” with it.

As Duncan argues, Leibniz is happy to regard images such as those we might find in a mirror as expressions (or, as Leibniz sometimes puts it, “representations”) of other things.²⁴ But the crucial difference between other forms of expression and perception is that the latter occur in simple things or “unities”, a fact which, as we have seen, Leibniz goes on to highlight shortly after. It is true that Leibniz does not explicitly say that this grounds the heterogeneity between mirror images and brain traces on the one hand and perception and thought on the other. But I do not find it too much of a stretch to think that this was the “conflict with reason” that underwrote Leibniz’s belief that we could never understand mentality in mechanical terms here.

Nonetheless, in his recent paper, Duncan has raised a challenge to Bobro’s and my earlier suggestion that this line of reasoning is present in Section 17 of the *Monadology*.²⁵ This stems from his understanding of the role that Section 17 is playing, namely as the final step in an argument that is supposed to establish the claim that perception is the representation of many in a unity. Clearly if this is right, it would provide compelling reasons not to think of the argument of Section 17 as relying on this account in the way that my reading does. But I am not sure that we should regard it in the way that Duncan suggests.

If we are to agree with Duncan’s interpretation, we need to interpret Sections 14–17 of the *Monadology* as follows: Leibniz introduces a definition of perception as the representation of a multitude in a simple substance in Section 14. He then uses Section 16 to persuade those who accept that the soul is simple also to accept his account of perception, on the grounds that they are aware of this in themselves. Finally, he uses an argument that appeals to the readers’ recognition of an explanatory gap to rule out the only other live option for those who do not accept that the soul is simple, namely those who advocate mechanical materialism.

But it is not clear that Section 14 is really functioning in the way that Duncan requires. Back in Section 2 of the *Monadology*, Leibniz establishes the existence of simple substances. From then on, he argues for a number of claims about the nature of these substances, and by the end of Section 12 he has argued that simple

24. Duncan 2012: 255.

25. Despite this challenge, Duncan does support reading the letter to Bayle in this way. See Duncan 2012: 252–256.

substances are the source of their own changes and must contain some kind of “diversity”. Section 13 then runs as follow:

13. This diversity must involve a multitude in the unity or in the simple. For, since all natural change is produced by degrees, something changes and something remains. As a result, there must be a plurality of properties and relations in the simple substance, although it has no parts. (GP: VI, 608/AG: 214)

It is immediately after this, at the beginning of Section 14, that Leibniz observes: “The passing state which involves and represents a multitude in the unity or in the simple substance is nothing other than what one calls perception” (*ibid.*). This is not so much a newly introduced definition of perception as an identification of perception with something that has already been presented as an essential feature of simple substances. With this in mind, we can turn to Section 16:

16. We ourselves experience a multitude in a simple substance when we find that the least thought we ourselves apperceive involves variety in its object. Thus, all those who recognize that the soul is a simple substance should recognize this multitude in the monad. (GP: VI, 609/AG: 215)

Here the claim is that those who agree that the soul is a simple substance should be happy to acknowledge that there are things that fit Leibniz’s description of simple substances more generally, or monads. After all, they should recognize that they themselves are such things.

But what of those who are tempted by mechanical materialism? It seems to me that whilst they are, as Duncan claims, the target of Section 17, they are not being persuaded to accept a definition of perception. Rather, they are being asked to acknowledge, on the basis of the initial claim from Section 16, that the perception they experience in themselves is something that is occurring within a simple substance rather than a machine, and, as result, again to accept that monads are as Leibniz has described them. Why would they do this? Because they apperceive, or have “reflective knowledge” of particular states that have multiple objects and which they thereby know must be unified in a way that could never be true of something that arose mechanically.

There is much here that might sound familiar from the discussion of Wilson’s interpretation above. But I am not evading Duncan’s challenge only to collapse the distinction between her reading and the one I favour. There is a crucial difference. What I am suggesting is that this passage appeals to the conscious experience of the reader as a bearer of states that unify a manifold, rather than an experience

of themselves as having conscious states that have a unity, *qua* conscious states.²⁶ This reading requires us to hear the passage with an ear that is perhaps quite foreign in light of Kant's famous separation of the notion of the unity of apperception from the notion of an entity that is a genuinely unified subject of representations. For it requires that we allow Leibniz to assume that his readers will acknowledge an awareness of themselves as perceivers, the object of which is distinct from the conscious awareness that they are. But we should not confuse the doubts that Kant's distinction might cast on the reasonableness of Leibniz's claims with the thought that this would have been a concern to Leibniz or his contemporaries. It seems to me, then, that the interpretation of the mill argument of Section 17 of the *Monadology* as based on considerations of the unity of perception can be defended against Duncan's worry.

As I acknowledged above, this reading of the *Monadology* and of the letter to Bayle must be treated with some caution. In neither case does Leibniz explicitly mention unity in the places where he presents the mill. But the surrounding text seems suggestive enough to me in each case. And, even if Leibniz did not put the consideration to quite the use that I am claiming, at the very least the unity of perception is a reason that Leibniz could have offered for the claim that nothing material could perceive, sense, or think.

3.4 Mechanical Explanation and Activity

For all that I have argued that the occurrences of the mill argument in the *Monadology* and the letter to Bayle are to be read in the way outlined in the previous section, I do not think that this exhausts the ways in which the argument should be understood. This is something that is borne out by considering Leibniz's discussion of thinking matter in a number of passages that, as far as I am aware, do not appear in any other treatment of the issues. One of these passages appears in the main body of the *New Essays*, in Book 4, Chapter 6, where Leibniz returns to the topic of thinking matter.

Leibniz's reasons for rejecting the natural activity of matter in Book 4 emerge as an explicit response to Locke's claim that matter might think where "Omnipotency has . . . given to some systems of matter fitly disposed, a power to perceive and think" (ECHU: 4.3.6/NE: 378). In considering this possibility, Leibniz observes: "I believe you agree, sir, that it is not within the power of a bare machine to give rise to perception, sensation, reason" (NE: 379). Given the dependency between perception, sensation, and thought that Leibniz articulates in the *Monadology*, one option would be to suggest that it is Leibniz's understanding of perception

26. It may be the case that Wilson was intending to offer something like this interpretation of Section 17 of the *Monadology*. However, it seems to me that the way in which she actually expresses her views does not invite this interpretation.

as involving unity that is again driving his rejection of mechanical materialism. However, closer examination of what follows reveals another possibility.

In book 4, following Locke, Leibniz couches his argument in terms of powers. In considering whether matter might acquire the power to perceive, sense, and think, Leibniz takes himself to be in agreement with Locke that a “bare machine”, of which both the mill and the watch from the *Preface* are examples, cannot have such a power. Before pursuing what Leibniz says at this point, it is worth pausing to consider what he says about the notion of power elsewhere in the *New Essays*. At the beginning of the chapter “‘Of power’ and freedom” (NE: 168–170), after presenting a very condensed version of Locke’s account of power from ECHU (2.21.1–2), Leibniz responds:

If ‘power’ corresponds to the Latin *potentia*, it is contrasted with ‘act’, and the transition from power into act is ‘change’. . . . Power in general, then, can be described as the possibility of change. But since change – or the actualization of that possibility – is action in one subject and passion in another, there will be two powers, one active and one passive. The active power can be called ‘faculty’, and perhaps the passive one might be called ‘capacity’ or ‘receptivity’. (NE: 169)

Here we see that the powers of a thing are its “possibilities of change” and that these come in two kinds, a thing’s active powers (which are also called faculties) to give rise to change and the passive powers (capacities or receptivities) to receive change.

These distinctions are pertinent when we consider the text immediately preceding Leibniz’s observations about his and Locke’s agreement in Book 4, Chapter 3, Section 6. Here we find:

[D]erivative powers, or ‘faculties’ if you like, are merely ‘ways of being’ – and they must be derived from substances, and are not derivable from matter considered as wholly mechanical, i.e., abstractly considered as merely that incomplete being which is prime matter or the purely passive. (NE: 379)

The power to think is a faculty or active power. And here Leibniz observes that faculties are “ways of being” (a notion that is equated with “modification” a few sentences later) that are not derivable from matter considered in the Lockean way, i.e., mechanical matter. Furthermore, his point appears to be that it is the fact that such matter is passive that prevents this. As we have seen above, modifications are merely limiting variations of some nature or other for Leibniz. The problem that he identifies here seems to be that something made of matter could only perceive,

sense, or think naturally if it could come to have the power to perceive, sense or think, i.e., if it could come to have a modification that was an active power.²⁷ This would require that something entirely passive become active through mere limitation. In other words, it would require precisely the augmentation that Leibniz rules out in a contemporary letter to De Volder (dating from 19 November 1703) when he observes that modifications “only limit things and do not increase them, and therefore they cannot contain an absolute perfection that is not in the thing to be modified” (LDV: 277).

Perhaps a little surprisingly, the claims made here about the power “to give rise to perception, sensation, reason”, appear to be parasitic on a more general one. Since mechanical matter is purely passive, any modifications (including any “faculty”) that might belong to something made of mechanical matter would be passive too. Thus, whilst a machine might have what Leibniz calls a “‘capacity’ or ‘receptivity’” (NE: 169) for motion, it could not have the kind of power required to give rise to any kind of change, including the coming into being of cognitive states.

The suggestion that this is the consideration that Leibniz relies on here is given further support in two ways. Firstly, it also allows us to see why Leibniz appears so confident that Locke and he agree on this issue. For, in the correspondence with Stillingfleet, Locke rejects the idea that matter “as matter” can come to have the power of thinking on the grounds that it is “devoid of all activity” (NE: 65), as Leibniz reports. Secondly, and more importantly, this consideration is made explicit in other passages in which the mill occurs, which have not been discussed in the secondary literature to this point, however.

The first such passage is in a draft letter to Queen Sophie Charlotte dating from 1702:

[S]upposing whatever traces, machines, or motions you like in the brain, one will never find the source of perception or of the reflection on oneself, which is a truly internal action, any more than one could find it in a watch or in a mill. For crude or subtle machines differ only in degree. (LTS: 259)²⁸

Whilst the passage is somewhat unclear, one might think that perception and self-reflection (a necessary condition for thought) are being ruled out due to the facts that they involve internal action and that matter is essentially passive. A second passage from “On the Souls of Men and Beasts” is perhaps more explicit. Leibniz begins the piece by noting that “matter taken in itself, i.e., bare matter, is constitut-

27. It is also worth noting that, in the letter to De Volder of 19 November 1703, Leibniz speaks of “perception, which certainly involves action” (LDV: 275).

28. The version of this letter that Leibniz sent no longer exists, but there are additional drafts. In one of these, the passage appears almost verbatim (LTS: 266). In another, the mill is not mentioned explicitly, but essentially the same considerations appear (LTS: 276).

ed from antitypy and extension” (GP: VII, 328/SLT: 63). In the next paragraph, he adds that “it is obvious that matter is something merely passive, since its attributes and variations involve no action” (ibid.). Next comes the mill:

In the same way, it is obvious that perception cannot be deduced from bare matter since it consists in some action. . . . Hence we can easily conclude that in any mill or clock taken by itself no perceiving principle is found that is produced in itself; and it does not matter whether solids, fluids, or a compound of both are considered in the machine. Moreover, we know that there is no essential difference between coarse and fine bodies except that of size. From this it follows that it cannot be conceived how perception arises in a crude machine, however constituted from fluids or solids, it also cannot be conceived how perception arises from a subtler machine, for if our sense were also more subtle it would be the same as if we were perceiving a crude machine, as we do now. And so it must be considered as certain that from mechanism alone, i.e., bare matter and its modifications, perception cannot be explained (GP: VII, 328–329/SLT: 64)

This passage could not be much clearer in its endorsement of the interpretation that I have offered in this section.²⁹ It seems plausible to think, then, that we have found in the *New Essays* and these additional texts another reason why Leibniz thinks that mechanical matter cannot have perception, sensation, and thought. Even the most complex machine would merely be a system of passive matter whose changes were motions initiated from without or through a redistribution of such motions. In no sense could such a machine have or acquire the capacity for genuine activity, as would have to be the case if it could naturally have or acquire a faculty of perception, sensation, or thinking.

Once alerted to the existence of this interpretation, one might wonder whether it is also at work in some of the other passages that we have already considered. Talk of action can indeed be found in the *Monadology*, with Leibniz observing at the end of Section 17 that it is in “perceptions and their changes . . . alone that all the *internal actions* of simple substances can consist” (GP: VI, 609/AG: 215). However, the fact that perception involves activity is an afterthought rather than part of the argument of that section. The letter to Bayle is somewhat different. For here Leibniz observes:

29. Absent the mill, the argument that thought could not be produced in a machine, given its essential passivity, is also found in a number of other places. See the letter to Bayle of 1702 (GP: III, 69/WF: 129) the letter to Damaris Masham of 30 June, 1704 (GP: III, 355–56/WF: 214) and the *Conversation of Philarete and Ariste*, which dates from 1712, with revisions from 1715 (GP: VI, 587/AG: 263).

We can also see that since thought is an action of one thing on itself, it has no place among shapes and motions, which could never provide the basis of an internal action. (GP: III, 68/WF: 129)

But although Leibniz seems to be endorsing the activity of thought as a basis for rejecting mechanical materialism, this passage occurs immediately after he has discussed the heterogeneity of machines and perceivers. Thus, whilst it provides additional support for the reading I am offering in this section, Leibniz seems to be suggesting that this consideration is distinct from whatever he had in mind in the discussion following the introduction of the mill in the letter to Bayle.

The case of the Preface to the *New Essays* is more complicated. The passage is very difficult to interpret. As we have noted, it is like Section 17 of the *Monadology* in that it contains no explanation of why it is that sensation and thought (there is no mention of perception in this case) are inexplicable in mechanical terms. Assuming we reject the explanatory-gap reading on the grounds given above, we again have the option simply to remain agnostic about Leibniz's reasons. And it may be that this is the safest strategy. However, it is worth at least entertaining the thought that this may be one of the cases in which Leibniz has the activity of sensation and thought in mind.

I think that two reasons speak in favour of this. The first is the fact that this passage is explicitly addressing the issue of thinking matter. As we have seen, when Leibniz returns to discuss this topic in the body of the text, it is the passivity of mechanical matter and activity of perception, sensation, and thought that drive the argument. The second is the fact that the mill passage appears in close proximity to a passage that presents an analogous attack on Newton's conception of gravity, which runs as follows:

So within the order of nature (miracles apart) it is not at God's arbitrary discretion to attach this or that quality haphazardly to substances. He will never give them any which are not natural to them, that is, which cannot arise from their nature as explicable modifications. So we may take it that matter will not naturally possess the attractive power referred to above, and that it will not of itself move in a curved path, because it is impossible to conceive how this could happen – that is, to explain it mechanically – whereas what is natural must be such as could become distinctly conceivable by anyone admitted into the secrets of things. (NE: 65)

Here we again find Leibniz concerned with the fact that an active power is being ascribed to a mechanical system, namely the power to attract bodies. Whilst it is true that he does not explicitly mention the passivity of matter as the source of

inexplicability, Leibniz's initial introduction of the issue is prefaced by an explicit reference to Locke's admission in his correspondence with Stillingfleet that he conceives of natural operations of matter as limited to impulse alone.³⁰ These considerations are not absolutely decisive, but they do provide us with a way of making his claims intelligible, given that we have seen that Leibniz explicitly regards the passivity of mechanical matter as inconsistent with activity in other places.

4. Conclusion

In the discussion above, I have suggested that Leibniz employs two strategies in order to sustain his argument from the inexplicability of perception, sensation, and thought to the rejection of mechanical materialism. Both rely on the legitimacy of inferring that mechanical materialism is false from the premise that perception, sensation, and thought are inexplicable in mechanical terms. However, they differ in the reasons for accepting the premise. The first relies on Leibniz's belief that perception involves unity in a way that precludes a mechanical explanation and his belief that both sensation and thought depend on perception. The second relies on Leibniz's belief that the powers to perceive, sense, and think are active powers.

I have also presented a view concerning the way in which these strategies bear on the interpretation of the individual passages that contain the mill argument. Here my claim is that, all things considered, it is reasonable (though by no means assured) that we should regard the passages that include the mill argument from the *Monadology* and the letter to Bayle as relying on Leibniz's assumptions about the unity of perception, and the passages from the letter to Sophie Charlotte, and "On the souls of men and beasts" (and perhaps the one from the Preface to the *New Essays*) as relying on his assumptions about the active nature of perception, sensation, and thought.

Abbreviations

A = Gottfried Wilhelm Leibniz (1923). *Sämtliche Schriften und Briefe*. Ed. Deutsche Akademie der Wissenschaften. Akademie-Verlag. Cited by series, volume, and page, e.g., A VI.ii: 229.

AG = Gottfried Wilhelm Leibniz (1989). *Philosophical Essays*. Eds. and trans. Roger Ariew and Daniel Garber. Hackett.

AT = René Descartes (1964–1976): *Oeuvres de Descartes* (Vols. 1–12). Nouvelle présentation. Eds. Charles Adam and Paul Tannery. J. Vrin. Cited by volume and page, e.g., AT: VIII.1, 71.

30. See NE (60).

- CSM** = René Descartes (1985–91). *The Philosophical Writings of Descartes* (Vols. 1–3). Eds. and trans. John Cottingham, Robert Stoothof, Dugald Murdoch, and Anthony Kenny. Cambridge University Press. Cited by volume and page, e.g., CSM: i.235.
- ECHU** = John Locke (1975). *An Essay Concerning Human Understanding*. Ed. P. H. Niddich. Clarendon Press. Cited by book, chapter, and section e.g., ECHU: 4.3.6.
- GP** = Gottfried Wilhelm Leibniz (1875–90; reprint 1960). *Die Philosophischen Schriften von Gottfried Wilhelm Leibniz* (Vols. 1–7). Ed. C. I. Gerhardt. Weidmann (reprint Olms). Cited by volume and page, e.g., GP: VI, 264.
- Klopp** = Gottfried Wilhelm Leibniz (1864–84). *Die Werke von Leibniz* (Vols. 1–11). Ed. Onnon Klopp. Klindworth. Cited by volume and page, e.g., Klopp: VIII, 264.
- L** = Gottfried Wilhelm Leibniz (1969): *Philosophical Papers and Letters: A Selection* (2nd ed.). Ed. and trans. Leroy Loemker. D. Reidel.
- LDV** = Paul Lodge (Ed. and trans.) (2013). *The Leibniz–De Volder Correspondence*. Yale University Press.
- LTS** = Lloyd Strickland (Ed. and trans.) (2011). *Leibniz and the Two Sophies: The Philosophical Correspondence*. Iter Inc. Centre for Reformation and Renaissance Studies.
- NE** = Gottfried Wilhelm Leibniz (1981). *New Essays on Human Understanding*. Eds. and trans. Peter Remnant and Jonathan Bennett. Cambridge University Press. Pagination is identical to the Akademie edition of this text in A: VI.vi.
- PWL** = Gottfried Wilhelm Leibniz (1908). *Philosophical Works of Leibnitz [sic]*. Ed. and trans. George Martin Duncan. Morehouse & Taylor.
- SLT** = Gottfried Wilhelm Leibniz (2006). *The Shorter Leibniz Texts*. Ed. and trans. Lloyd Strickland. Continuum.
- WF** = R. S. Woolhouse and Richard Francks (Ed. and trans.). (1997). *Leibniz’s “New System” and Associated Contemporary Texts*. The Clarendon Press.

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