Leibniz on Pre-established Harmony and Causality

Jeffrey K. McDonough

Introduction

I see the soccer ball in front of me. I intentionally move my leg to kick it. My foot hits the ball and it sails through the air. But it is a lousy shot. The ball goes straight at the goalkeeper. It strikes her hands and she feels a painful sensation in her mind. She spots a teammate breaking down the sideline, decides to act, and throws the ball down field. It lands just in front of him. A few kicks later it swishes into the net.

Leibniz's theory of pre-established harmony is first and foremost an account of the (apparent) interaction between our minds and our bodies. It is a theory of what happens when I intend to move my leg and my leg moves as well as what happens when the goalkeeper catches the ball and experiences a painful sensation in her mind. Section 1 below will explicate Leibniz's theory of pre-established harmony, relate it to opposing theories, and show how it sets up Leibniz's suggestion that there are two realms, one of bodies and efficient causation, one of minds and final causation.

Leibniz's theory of pre-established harmony, however, is not just an account of the (apparent) interaction between our minds and our bodies. Section 2 will therefore look more closely at Leibniz's understanding of causation within realm of bodies – his understanding, for example, of the (apparent) causal interaction between my foot and the soccer ball, the soccer ball and the net. Section 3 will do the same for Leibniz's account of causation within the realm of minds or "monads" – his account, for example, of how I come to have a perception of the ball and form an intention to kick it.

As we will see, Leibniz's theory of pre-established harmony is much more than a clever solution to a long-standing problem in early modern metaphysics. It is the most visible seam, as it were, of Leibniz's remarkably rich, complex, and still underappreciated understanding of causation in the created world.

1. A Pre-established Harmony: Bodies and Minds

It seems obvious that our minds and our bodies causally interact. I form the intention to move my leg and my leg moves; the ball hits my hands and I experience a painful sensation. But how exactly does this causal interaction work? How is it that our minds can causally affect our bodies and our bodies can causally affect our minds? Leibniz's novel solution to this mind-body problem suggests that they can't. The interaction between our minds and our bodies that seems so obvious to us is, in reality, an illusion, although "well founded." According to Leibniz, from the moment of creation, God has coordinated our bodies and our minds in such a way that they only appear to causally interact. At just the moment that I form an intention to move my leg, my leg moves of its own accord. At just the moment that the ball collides with my hand, my mind independently comes to experience pain. My mind and my body are, Leibniz suggests, like two causally independent but synchronized clocks; the appearance of causal interaction between them is an illusion founded on a harmony pre-established by God (G 4:520).

Leibniz's theory of pre-established harmony is even bolder than it might at first appear. For each mind, according to Leibniz, is not only harmonized with its own body, but also with every other existing body. Drawing on broad theoretical considerations, Leibniz insists that each mind perceives everything that happens in its world (see, for example, G 6:598-599). I perceive not only the ball in front of me but also – if only unconsciously – events on the other side of the city, on the other side of the earth, indeed, on the other side of the universe. When a change happens in any body anywhere, a corresponding change occurs in my mind. Conversely, Leibniz maintains that every mind is associated with a body, and all bodies are "connected." So when a change happens in any mind with a corresponding change in its body, ripple-effects occur in every other existing body (A.Vi.iv. 1646-1647). Leibniz's theory of pre-

established harmony thus ultimately demands not merely the divine coordination of particular mind-body pairs, but even more boldly the divine coordination of each mind with all existing bodies and each body with all existing minds.

Leibniz defends his theory of pre-established harmony by highlighting what he sees as its many virtues. He argues that it helps to reconcile the metaphysics of Aristotelian-Scholasticism with mechanistic science (G 4:478-479). That it attributes a "correspondance" between substances that is "une chose admirablement bell en elle même et digne de son auteur" (1696, 167). That it allows him to explain why, even if minds and bodies cannot causally interact, they nonetheless appear to causally interact, and can even informally be said to causally interact just as Copernicans can speak "veritablement" of the rising of the sun (1696, 168). He argues that his theory of pre-established harmony provides a novel account of the union of the soul and the body since "c'est ce rapport mutual reglé par avance dans chaque substance de l'univere … qui fait uniquement *l'union de l'ame et du corp*" (4:484-485, but see also G 6:595). But perhaps its greatest virtue, by Leibniz's lights, is that it has no tenable rival. Leibniz thinks that in a game of last man standing, the principal alternatives to his theory of pre-established harmony collapse.

Leibniz dubs one of those alternatives the theory of physical influx (*influxus physicus*). The theory of physical influx, as Leibniz understands it, suggests that minds and bodies causally interact when something – some form of being – passes from one substance to the other. Although they were often vague on precisely this point, Leibniz's suggestion that many of his predecessors embraced such a view is not with some basis.[1] In his authoritative and systematic discussion of causation, the great seventeenth century Scholastic, Francisco Suárez, for example, writes:

> Causa est principium per se influens esse in aliud … Per illam autem particulam, per se influens, excluditur privatio, et omnis causa per accidens, quae per se non conferunt aut influunt esse in aliud. Sumendum est autem verbum illud influit … generalius

---

[1] For discussion of the theory of physical influx, especially in relation to Leibniz, see O'Neill (1993). For a history of the theory after Leibniz, see Watkins (1995).

prout aequivalet verbo dandi vel communicandi esse alteri.
(1866, 25:384b)[i]

Suarez's definition does indeed suggest that genuine causation occurs when a cause transfers some form of being to its effect. It implies that my foot causes the soccer ball to move by transferring something to the soccer ball – perhaps motion or energy – and that a picture of, say, Pelé causes my mental representation of Pelé by transferring something of Pelé image or likeness, first to a medium, then to my sensory organs, and ultimately to my mind.

      Leibniz rejects the theory of physical influx both as a general theory of causation and, more specifically, as an account of the causal interaction of minds and bodies. He rejects it as a general theory of causation because he thinks it is simply inconceivable that anything can be transferred from one substance to another. So, for example, he writes, "on ne sçauroit concevoir ny des particules materielles, ny des especes ou qualités immaterielles, qui puissant passer d'une de ces substances dans l'autre" (GP 4:499). If intended with full generality, Leibniz's position doesn't seem terribly convincing. What is so hard about conceiving, say, some material particles passing from one material body to another? Leibniz's case might, however, seem stronger when restricted to the causal interactions of minds and bodies (or minds and minds). Leibniz famously argues that monads – mind-like substances – "n'ont point de fenêtre, par lesquelles quelque chose y puisse entrer ou sortir" (G 6:607 [§7]). If that is granted, however, then clearly causal interactions between minds and bodies (or minds and minds) cannot be understood in terms of the theory of physical influx. For if nothing can go in or out of minds, then they can neither receive from, nor impart to, anything, including forms of being, as the theory of physical influx demands.

      A second alternative to Leibniz's theory of pre-established harmony is the theory of occasionalism. The theory of occasionalism had already enjoyed a long history before Leibniz's time, reaching back well into Arabic and Latin medieval philosophy. It found new impetus, however, in suggestive remarks made by Descartes and was developed in various ways by second generation Cartesians such as Géraud de Cordemoy, Louis de la Forge, Arnold Geulincx, Johannes Clauberg, and

above all, Nicholas Malebranche.[2] The central idea of occasionalism is that God is the only genuine, efficacious cause in the world. Creatures lack any causal efficacy of their own and serve merely as occasions for God's direct causal intervention. My wanting to kick the ball thus does not cause my leg to move. Rather it serves merely as an occasion for God's directly moving the ball himself. The ball's striking my hands does not cause me to feel a stinging sensation. Rather it serves merely as an occasion for God's directly affecting my mind. Although not popular today, the theory of occasionalism attracted a considerable following in Leibniz's era and was supported by a raft of formidable arguments some of which continue to motivate some contemporary views on causation.

Leibniz rejects occasionalism for a wide variety of reasons. One line of argument draws on his understanding of the nature of created substances. According to Leibniz, it is essential to created substances to be loci of causal activity (G 4:515). To suppose that creatures enjoy no causal efficacy of their own would be to reduce them to mere modes of God. To Leibniz's way of thinking, occasionalism thus collapses into the doctrines of Spinoza since "ex Deo factura cum Spinosa videatur ipsam rerum naturam, cum id quod non agit, quod vi active caret, quod discriminabilitate, quod denique omni subsistendi ratione ac fundamento spoliator, substantia esse nullo modo possit" (G 4:515 [§14]).[ii] Another line of argument draws on Leibniz's understanding of God's perfection. Leibniz maintains that his theory of pre-established harmony, according to which God's design is so perfect that it requires no subsequent corrective intervention, is more suitable to God's perfection than is the theory of occasionalism, which would require God to constantly tinker with his creation.

In presenting his theory of pre-established harmony, Leibniz often speaks of there being two realms, a realm of bodies and efficient causation on the one hand, and a realm of souls and final causation on the other. So, for example, in the *Monadology*, Leibniz writes:

> Les ames agissent selon les loix des causes finales par appetitions, fins et moyens. Les corps agissent selon les loix des causes efficientes ou des mouvemens. Et les deux regnes, celuy

---

[2] For an overview of the development of the theory of occasionalism, see Gouhier (1926, 80-107), Nadler (2011), and Prost (1907).

des causes efficientes et celuy des causes finales, sont
harmoniques entre eux. (G 6:620)

Similarly, in his the *Principles of Nature and Grace*, Leibniz tells us that "les changemens des corps et les phenomenes au dehors naissent les uns de autres par les loix des causes efficientes, c'est à dire des mouvemens" while "perceptions dans la Monade naissent les unes des autres par les loix des Appetits, ou des causes finales du bien et du mal" (G 6:599 [§3]). Such remarks suggest an intuitive, even attractive picture. Minds unfold teleologically, that is, they act for the sake of ends. I will, for example, to kick the ball in order to score a goal. Bodies unfold efficiently, that is, they are driven along by efficient causes in accordance with the laws of nature. The soccer ball, for example, travels with a given velocity because my foot struck it with a given velocity. This intuitive picture – according to which Leibniz's pre-established harmony between minds and bodies is simultaneously a pre-established harmony between final and efficient causation – is elegant and accurate as far as it goes. But it is not the whole story. The next two sections will show that Leibniz's pre-established harmony between minds and bodies is underpinned by a pair of less-well appreciated harmonies, one within the realm of bodies, one within the realm of minds.

2. Causation in the Realm of Bodies

My foot hits the soccer ball and it flies off with a given speed in a given direction. It ricochets off the goal post with a different speed and a new direction. Perhaps it collides with another ball on the sideline sending both along predictable trajectories. How are we to best explain such interactions between material bodies, between feet and balls, balls and posts, balls and balls, etc.? Leibniz agrees with his fellow proponents of the new science, that the behaviors of bodies are paradigmatically to be explained by appeal to laws of nature, laws like Galileo's law of falling bodies and Newton's third law of motion.[3] Leibniz contributed to the project of formulating and refining such laws. He offers devastating

---

[3] For a helpful overview of the rise of lawful explanations in early modern science, see Milton (1998).

criticisms of Descartes's laws of collision (G 3:53, G 3:46). He
vigorously defends a series of conservation laws, including, most
famously, the conservation of *vis viva* (GM 6:226-231). He offers novel
derivations of the principal laws of optics (see especially Dutens 3:145-
150 and G 7:270-279). More to the point of our present concerns,
however, Leibniz also seeks to clarify what he sees as the philosophical
implications of the laws of nature, defending, in particular, three central
theses.

      The first thesis concerns the modal status of the laws of nature.
Are laws such as Galileo's law of falling bodies necessary or contingent?
Descartes's hugely influential treatment of the laws of motion implied to
many that the laws of nature must be necessary – a view defended
explicitly half-generation later by Spinoza. On such a view, the laws *must*
be as they are. Galileo's law of falling bodies could no more fail to hold
than could the laws of geometry or arithmetic. Another view, attributed
by Leibniz to Bayle, and dominant today, is that the laws of nature are
contingent and arbitrary (G 6:316 [§340], G 6:318-319 [§344]). On such
a view, Galileo's law just happens to be true. The world could have been
different with respect to falling bodies: instead of falling with constant
acceleration, bodies might have fallen with constant velocity or variable
acceleration. Furthermore, on this view, there is no decisive reason in
favor of Galileo's law. If we imagine – as most early modern
philosophers did – that God has created the world, we may imagine him
as being indifferent, or at least not set upon, creating the world in
accordance with Galileo's law.

      Leibniz opposes both of these – as he sees it – extreme views.
He maintains that the laws of nature are neither necessary nor arbitrary.
They are rather contingent but nonetheless determined by
considerations of optimality. Thus in his *Theodicy*, he writes:

> Ces considerations font bien voir que les loix de la nature qui
> reglent les mouvemens ne sont ny tout à fait necessaires, ny
> entierement arbitraries. Le milieu qu'il y a à prendre, est qu'elles
> sont un choix de la plus parfaite sagesse. Et ce grand exemple
> des loix du movement fait voir le plus clairement du monde,
> combine il y a de difference entre ces tois cas, savoir
> premierement une necessité absolue, metaphysique ou
> geometrique, qu'on peut appele aveugle et qui ne depend que des
> causes efficientes; en second lieu, une necessité morale, qui vient

du choix libre de la sagesse par rapport aux causes finales; et
enfin en troisieme lieu, quelque chose d'arbitraire absolument,
dependant d'une indifference d'equilibre qu'on se figure, mais
qui ne sauroit exister, où il n'y a aucune raison suffisante ny dans
la cause efficiente ny dans la finale. (G 6:321 [§349], see also G
6:319 [§345], G 6:603 [§11])

Leibniz effectively suggests that both Descartes and Bayle are wrong.
Descartes is wrong because there is a sense in which the laws of nature
are contingent. If we abstract from God's goodness, we can imagine
God's creating the world with different laws. In this respect, the laws of
nature are not like the laws of arithmetic and geometry. But Bayle – at
least as Leibniz interprets him – is also wrong. Although the laws of
nature are contingent, they are not arbitrary. God, according to Leibniz,
has chosen to instantiate the actual laws of nature not out of whim or
fancy, but because they are essential to the best of all possible worlds.[4]

   Leibniz's second thesis concerns what we might think of as the
metaphysics of the laws of nature. What are the laws of nature and how
do they govern the world? Talk of the laws of nature, their creation,
their discovery, etc. can encourage the thought that laws of nature are
thing-like, that they are independent ingredients in the world on a par
with minds and bodies. But that cannot be Leibniz's picture. Leibniz's
fundamental ontology of the created world is exhausted by substances:
true unities modeled on minds or organisms. Not being true unities –
being nothing like minds or organisms – laws of nature cannot be
counted among the fundamental ingredients of the created world.
Rather, for Leibniz, they must be identified with concepts or
abstractions enjoyed by rational minds and applicable to events in the
world. Galileo's law of falling bodies is not a thing but rather a pattern, a
regularity or rule understood by God and other intelligent minds. With
the laws of nature so understood, it is also immediately clear that, for
Leibniz, the laws of nature cannot govern bodies by, say, pushing or
pulling them around. Instead, Leibniz maintains that bodies are
determined in their behavior by forces within bodies themselves. Heavy
bodies near the surface of the earth fall with a constant acceleration not

---

[4] For discussion of Leibniz's views on contingency in connection with
the laws of nature see Okruhlik (1995), McDonough (2010), Wilson
(1976).

because the laws of nature push or pull them, but rather because they have been endowed with intrinsic powers that direct them to fall with constant acceleration. For Leibniz, laws of nature are explanatorily powerful insofar as they allow us to subsume particular phenomena under general regularities, but they are not causally powerful in the sense that they directly bring about the behaviors they subsume.

Leibniz argues that his account of the efficacy of the laws of nature is superior to the account provided by occasioanlsits such as Malebranche. Malebranche identifies the laws of nature with divine decrees. But how are those decrees supposed to regulate the behavior of bodies? Leibniz argues that if the laws of nature are identified with general decrees made at the beginning of creation, but not grounded in the intrinsic powers of bodies, then they cannot now be effective for "Nam jussio illa praeterita cum nunc non existat, nihil nunc efficere potest, nisi aliquem tunc post se reliquerit effectum subsistentem, qui nunc quoque duret et operetur" (G 7:507). But might not the laws of nature be identified with general decrees and their efficacy nonetheless be grounded in God's particular volitions, volitions made in accordance with those general decrees?[5] Leibniz thinks this would be no better. For he insists that miracles occur whenever something happens "qui passé les forces des creatures" as would happen, for example, if water were to burn or pigs were to fly (G 4:520). Given such an understanding of miracles, Leibniz argues that if the efficacy of the laws of nature were grounded in God's particular volitions, then God would be committed to incessantly performing miracles. Seeing such activity as being unworthy of God's wisdom, Leibniz concludes that occasionalists fail to offer a tenable view of the nature and efficacy of the laws of nature.

Leibniz's third central thesis concerns the roll of teleological explanations in the natural sciences. Descartes had famously promised to make no appeals to final causes in his physics (AT 8A: 15-16, AT 7:55). To many, Spinoza seemed to go a step further in suggesting that teleological explanations get the order of explanation the wrong way around and that final causes are "nothing but human fictions" (1925, 2:80 [Part 1, Appendix]). While acknowledging the limits of earlier

---

[5] For discussion of Malebranche's views on the nature and efficacy of the laws of nature, see Steven Nadler, "Occasionalism and General Will in Malebranche," *Journal of the History of Philosophy* (31:1) 1993.

scholastic explanations, Leibniz nonetheless argues that a wholesale rejection of teleological explanation is neither necessary nor prudent. Like many proponents of the new science, Leibniz is happy to grant that we cannot hope to know all of God's ends, but he sees no reason to suppose that we cannot discern some of them (Dutens 1768, 2.2.132). He thus complains that it is "il est déraisonnable d'introduire une intelligence souveraine ordonnatrice des choses, et puis au lieu d'employer sa sagesse, ne se server que des proprietés de la matiere pour expliquer les phenomens" G 4:446 [§19]. He argues further that the "la voye des finales" is often helpful for making discoveries in the realm of nature, and that the study of anatomy provides clear cases of its effective use (G 4:448 [§22]).

Leibniz's work on the laws of optics provides him with another, less obvious, route for defending teleological explanations. Around the late 1670's, Leibniz came to see that the law of reflection could be derived from a principle according to which, as he puts it, "natura aliquem sibi finem proponens optima media eligit" (A VI.ivB.1404).[iii] By the early 1680's, Leibniz was able to provide a unified account of the two central laws of geometrical optics – the law of reflection and the law of refraction – by showing how both follow from the principle that light always travels along "easiest paths," where easiest paths are rigorously defined in terms of distance and the resistances of the relevant mediums (Dutens 1768 [1682], 3:145-150). Leibniz continued to develop his approach to the laws of optics over the decades that followed, showing, for example, in his *Tentamen Anagogicum* of 1696 how optimal paths could also be determined in more difficult cases involving concave and convex mirrors (G 7:270-279). In a series of pioneering studies, Leibniz showed how similar reasoning could also be applied to solve specific problems in mechanics. The techniques that Leibniz pioneered in his optical and mechanical studies proved to be precursor to what are now known as variational principles – powerful, explanatory, law-like principles that are still widely employed today in the study of the natural world.[6]

---

[6] For discussion of the history of the development of the variational principles, see Goldstine (1980) and Woodhouse (1810). For discussion of Leibniz's application of the reasoning found in his optical studies to specific problems in mechanics, see McDonough (2016a) and (2016b).

Leibniz suggests that what we may call his "optimality principles" support teleological explanations within the natural world in two rather different ways. First, Leibniz thinks that optimality principles – like elegant laws of motion and simple conservation principles – support teleological arguments from design by indicating that "marquent que l'univers est l'effect d'une puissance intelligente universelle" and by revealing "la sagesse de l'auteur dans l'ordre et dans la perfection de l'ouvrage" "the wisdom of the Author in the order and perfection of his work" (G 7:270, G 7:272). Second, Leibniz also maintains that optimality principles in particular license teleological explanations within the order of nature. He thus tells us that "finales causae … subinde magno cum fructu etiam in physicis specialibus adhibentur, non tantum ut supreme Autoris pulcherrima opera magis admiremur, sed etiam ut divinemus interdum hac via, que per illam efficientium non aeque aut non nisi hypothetice patent" (G 6:243).[iv] Leibniz's thought here is that just as we might explain a player's running down the field in order to prevent her opponent from scoring, so too – by appealing to optimality principles – a natural philosopher might explain the behavior of a ray of light by appealing to the "goal" of following an optimal path. For Leibniz, optimality principles thus support both divine and natural teleological explanations.

If we pause to take a step back, we can see that Leibniz's account of causation within the natural world is more complicated and intriguing than it might at first appear. With respect to bodies in the natural world, Leibniz accepts the broad explanatory framework suggested by the new science. The behaviors of bodies are to be explained by appeal to laws of nature. He offers, however, a distinctive picture of the nature and causal efficacy of the laws of nature. The laws themselves are concepts or abstractions corresponding to events in the natural world. Those events are brought about by forces intrinsic to bodies themselves. Like apparent mind-body interactions, body-body interactions are, for Leibniz, ultimately grounded in a pre-established harmony. Furthermore, Leibniz not only defends the design of the laws of nature themselves, but also defends teleological explanations within the realm of nature, suggesting that the behavior of material bodies may be explained by appeal to final causes. That, however, implies that even among bodies themselves there is not only a pre-established harmony of bodies with bodies but also a harmony of final and efficient causation.

3. Causation in the Realm of Minds

The foundations of Leibniz's most mature metaphysics are exhausted by mind-like "monads." The "monadology" thus famously opens with the suggestion that "La *Monade*, don't nous parlerons icy, n'est autre chose, qu'une substance simple, qui entre dans les composés … Et il faut qu'il y ait des substances simples, puisqu'il y a des composes; car le composé n'est autre chose, qu'un amas, ou *aggregatum* des simples" (G 6:607 [§1-2]). In a slightly more informative passage from the same period, Leibniz writes: "Substantia est vel simplex ut anima, quae nullas habet partes, vel composite ut animal, quod constat ex anima et corpore organico. … [autem] patet non nisi in substantiis simplicibus sisti, et in iis esse rerum omnium modificationumque rebus venietium fontes (C 13-14, see also G 2:72, G 2:267).[v] While commentators continue to disagree over the exact nature of the metaphysical relationship between monads and bodies, almost all agree that in his most mature period, Leibniz thinks that the causal activity of creatures is ultimately grounded not in bodies but in monads alone.

Monads, according to Leibniz, contain both perceptions and appetites. In virtue of their perceptions, monads perceive the world around them. Indeed, Leibniz maintains that in virtue of their perceptions, each monad perceives, from its own point of view, consciously or unconsciously, everything that has, is, or will happen in its world (G 6:607, G 6:598-599, G 6:617). According to Leibniz, I not only perceive the ball now in front of me, but I also perceive things currently happening on other side of the city, things that have already happened on the other side of the earth, and things that are yet to happen on the other side of the universe. And you, of course, do something similar from your own distinct point of view. In virtue of their appetites, monads transition from one perceptual state to the next. Appetites thus constitute, as he puts it, "L'action du principe interne, qui fait le changement ou le passage d'une perception à une autre" (G 6:609). As with perceptions, each monad enjoys its own unique array of appetites, the vast majority of which do not even arise to the level of conscious awareness. I may be consciously aware of my desire to score a goal and oblivious to my faint desire to scratch the back of my leg.

Leibniz further distinguished between three kinds of monads on the basis of their representational capacities. The lowest kind of monad – what Leibniz calls "bare monads" – have perceptions that are typically highly confused. Leibniz tells us that "si nous n'avions rien de distingué et pour ainsi dire de relevé, et d'un plus haut goût dans nos perceptions, nous serions tousjours dans l'étourdissement. Et c'est l'état des Monades toutes nues" (G 6:611 [§24])." The "souls" of plants serve as paradigms of bare monads. Monads of the intermediate level – what Leibniz calls "sensitive" monads – have not only confused perceptions but also the ability to be consciously aware of distinct entities as distinct entities (NE 173). The souls of animals serve as paradigms of sensitive monads. The highest kind of monad – what Leibniz calls minds – have perceptions that provide them with higher-order thoughts – the ability to reflect on their own perceptions and themselves. Leibniz maintains that because they enjoy higher-order thoughts, minds are capable of grasping necessary truths concerning morality, mathematics, and metaphysics (G 6:600-601 [§5]; NE 173). The souls of humans serve as paradigmatic examples of minds.

It is clear from Leibniz's theory of pre-established harmony that monads are supposed to unfold teleologically. And it is relatively easy to see how this might be so in the case of minds. I am confronted with an array of perceptions, some clear and salient, other confused and dim. I see an opponent with the ball breaking towards my team's goal. I also have a well of appetites – desires for things and states of affairs – some clear and salient, others dim and confused. Seeing the opponent break towards my team's goal, I want to prevent him from scoring. Those appetites determine, or help to determine, what I experience next. While there is no direct causal interaction between my mind and my body, my appetites drive me from one perceptual state to the next. My appetite – my desire – to prevent my opponent from scoring causally contributes to my coming to have new perceptions, say, of my legs moving, of my opponent getting closer, etc. While there are wrinkles in the details, it is relatively easy to see how we might understand the teleological unfolding of monads in cases of willful, voluntary action.

It is less clear how we should understand the teleological unfolding of monads in cases of non-willful, non-voluntary action. In a note in his *Dictionaire histonque et critique*, Pierre Bayle famously raises just such a case. Bayle notes that according to Leibniz's theory of pre-

established harmony there is a sense in which a "dog's soul would feel hunger and thirst at certain times even if there were no bodies in the universe" since the soul of the dog unfolds without any direct causal intervention from its body. Bayle objects however:

> je ne saurois comprendre l'echainement d'actions internes & spontanées, qui feroit que l'ame d'un chien sentiroit de la douleur immédiatement après avoir senti de la joie, quand même elle feroit seule dans l'Univers. Je comprens pourquoi un chien passé immédiatement du plaisir à la douleur, lors qu'étant bien affamé, & mangeant du pain, on lui donne subitement un coup de bâton; mais que son ame foit construite de telle forte, qu'au moment qu'il est frappe il sentiroit de la douleur, quand même il continueroit de manger du pain sans touble ni empêchement, c'es ce que je ne saurois comprendre. (Bayle 1730, 83 [Note H])

Bayle finds the spontaneity of a dog's soul, as demanded by Leibniz's theory of pre-established harmony, to be "fort incompatible la spontanéïté de cette ame avec les sentimens de douleur" (Bayle 1730, 83 [Note H]). But we might see an even more general concern here. Suppose we grant that we can understand how monads might unfold teleologically in cases involving willful, voluntary actions. We might still wonder if we can really understand how monads can unfold teleologically in cases where their successive representational states are not willful or voluntary, either because they are not perceived as being good, as seems to be the case with Bayle's dog, or because they are not consciously perceived at all, as will always be the case for bare monads (and for higher monads as well much of the time).

Commentators disagree over how they think Leibniz does, or should, respond to worries raised by Bayle's objection. One line of response suggests that we should always understand the teleological unfolding of monads on the model of willful, voluntary action (see, for example, Bolton 2013, Carriero 2008, McDonough 2016b). That Leibniz himself means to embrace this response is suggested by one of his letters to Sophie Charlotte dated 8 May 1704. There he writes:

> Quand nous voyons … l'ame suivre les loix morales du bien et du mal apparent dans quelque deliberation: disons des autres cas que nous ne voyons pas ou que nous ne demêlons pas si bien, qu'il en est de même, et que c'est tout comme icy. C'est à dire, expliquons les choses dont nous n'avons qu'une connoissance

> confuse, par celles dont nous en avons une distincte, et disons
> que …. tout se fait moralement dans l'ame, ou suivant les
> apparences du bien et du mal, tellement que même dans nos
> instincts ou dans les actions involontaires où le seul corps paroist
> avoir part, il y a dans l'ame un appetit du bien ou une fuite du
> mal qui la pousse, quoyque nostre reflexion ne puisse point en
> demêler la confusion. (G 3:346-347)

Leibniz's thought here suggests that although the behavior of bare monads cannot be exactly like the behavior of minds, nonetheless our experience of our own minds gives us our best and only grip on what it is like to be a bare monad. Just as we model unconscious appetites and perceptions on conscious appetites and perceptions, so we should model the causal development of bare monads – and all monads to the extent that they are like bare monads – on our own causal development. In this way, as Leibniz puts it in another letter of 1704, this time to Damaris Masham, "les Actions internes dans l'Ame: le tout ne consistant que dans l'estat present joint à la tendence aux changemens, qui se sont dans … l'ame suivant les perceptions du bien et du mal" (G 3:341).

      An alternative line of response suggests that monads enjoy more than one kind of appetite (see Jorati 2013, Rozemond 2009, Rutherford 2005,). Some appetites are willful, voluntary appetites, they are appetites modeled on desires and tied to a monad's own perception of the good. When I am motivated to kick the ball, my experience is driven along by such appetites, by my desire to kick the ball and my seeing kicking the ball as being good. Other appetites are non-willful or involuntary appetites. When the dog is struck by a stick it transitions to perceptions of pain. But it is not driven to those painful perceptions by willful, voluntary appetites. Nonetheless it must be driven to those perceptions by some appetite – as we have seen, Leibniz insists that each monad is causally isolated from both bodies and other monads. So, according to this line of response, monads must be endowed not only with willful, voluntary appetites, but also with non-willful, non-voluntary appetites, appetites that are not guided by the monad's own perception of the good. Although there is little textual evidence that Leibniz means to countenance appetites not governed by a monad's own perception of the good, this proposal at the least offers an intuitive solution to Bayle's objection. It allows us to suppose that Bayle's unfortunate dog is driven from its pleasant perceptual state to its unpleasant perceptual state

primarily by non-willful, non-voluntary appetites. The postulation of more than one kind of appetite thus offers a relatively straightforward replacement within Leibniz's system for the causal influences that we would normally attribute to external causes.

That monads unfold teleogically does not, for Leibniz, preclude their unfolding efficiently. And, indeed, there are good reasons to suppose that Leibniz thinks that monads do also unfold efficiently. He describes monads as being driven along by their past perceptions and appetites according to their laws of the series, and he explicitly tells us that "repraesentationem finis in anima causam effcientem esse repraesentationis mediorum in eadem" (Dutens 2.2.134)[vi]. Leibniz's efficient causal story is complicated somewhat by his support of the traditional theological doctrines of divine conservation and divine concurrence. Philosophers and theologians originally crafted those doctrines to maximize the dependence of creatures upon God insofar as such dependence is consistent with human responsibility. Some commentators have argued that Leibniz's commitment to doctrines of conservation and concurrence ultimately undermines his commitment to the efficient causality of monads (see especially Sleigh 1990 and Lee 2004). It may be more likely, however, that Leibniz believes, just as his scholastic predecessors believed, that he could reconcile such traditional theses with a commitment to genuine creaturely causation (see McDonough 2007).

If Leibniz does maintain that monads unfold both teleologically and efficiently, we are left with a picture of the realm of souls that mirrors the picture of the realm of bodies we saw in the previous section. In articulating his theory of pre-established harmony, Leibniz emphasizes efficient causality in the realm of bodies and final causality in the realm of minds. As we saw, however, closer inspection of Leibniz's understanding of causation within the realm of bodies reveals a more intriguing picture. The behavior of bodies, it appears, can be explained either in terms of efficient causation or final causation. Similarly, however, in the realm of souls. In articulating his theory of his pre-established harmony, Leibniz emphasizes that minds unfold teleologically. Closer inspection, however, reveals a more intriguing picture here as well. The teleological unfolding of monads is paralleled by an efficient causal unfolding. Leibniz's famous pre-established harmony between minds and bodies is thus underpinned by a pair of

less widely recognized causal harmonies, one within the realm of bodies, one within the realm of minds.

Abbreviated References

A = Leibniz, G.W. (1923-). *Sämtliche Schriften und Briefe*. Deutsche Akademie der Wissenschaften zu Berlin (eds). (Berlin: Akademie-Verlag). Reference is to series, volume, and page.

AT = Descartes, René (1996). *Oeuvres de Descartes*, Charles Adam and Paul Tannery (eds.). 11 vols. (Paris: J. Vrin). References is to volume and page.

C = *Opuscules et fragments inédits de Leibniz*, Louis Couturat, ed. (Paris: Félix Alcan, 1903. Reprint, Hildesheim: Georg Olms, 1966).

Dutens = L. Dutens. Genevia: Fratres de Tournes, 1768; reference is to volume, part, page.

G = *Die Philosophische Schriften von Gottfried Wilhelm Leibniz*, G C. I. Gerhardt, ed., (Berlin: Weidmann, 1875-90; repr. Hildesheim: Olms, 1960). Reference is to volume and page.

GM = *Mathematische Schriften von Gottfried Wilhelm Leibniz*, C. I. Gerhardt, ed., (Berlin: A. Asher; Halle: H.W. Schmidt, 1849-63). Reference is to volume and page.

NE = Nouveaux essais sur l'entendement in A VI.vi. Reference is to page number.

Works Cited

Pierre Bayle, *Dictionaire historique et critique* (Amsterdam: P. Brunel, 1730).

Bolton, Martha Brandt. 'Change in the Monad.' *The Divine Order, the*

Human Order, and the Order of Nature: Historical Perspectives. Ed. Eric Watkins. Oxford: Oxford University Press, 2013. 175–94.

Goldstine, H. 1980. *A History of the Calculus of Variations from the 17th through the 19th Century*, Berlin 1980.

Gouhier, Henri. 1926. *La Vocation de Malebranche* (Paris: J. Vrin).

Jorati, Julia. 'Monadic Teleology Without Goodness and Without God.' *The Leibniz Review* 23 (2013): 43–72.

Lee, S., 2004. "Leibniz on Divine Concurrence," Philosophical Review, 113: 203–48.

Leibniz, G.W. 1696. "Éclaircissement du nouveau system de la communication des substances, pour server de réponse à ce que en a eté dit dans le journal du 12 septembre 1695" *Journal des savants*, no. 14 (2 April 1696), pp. 166-8.

McDonough, Jeffrey K. 2016a. "Leibniz and the Foundations of Physics: The Later Years," *The Philosophical Review* (125:1) 2016: 1-34.

----. 2016b. "Leibniz on Monadic Agency and Optimal Form," *Studia Leibnitiana Sonderhaft, Leibniz and Experience*, ed. Arnauld Pelletier (Stuttgart: Franz Steiner Verlag) 93-118.

---- 2010. "Leibniz's Optics and Contingency in Nature," *Perspectives on Science* (18:4) 432-455.

----. 'Leibniz: Creation and Conservation and Concurrence.' *The Leibniz Review* 17 (2007): 31–60.

Milton, John R. 1998. "Laws of Nature," in *The Cambridge History of Seventeenth Century Philosophy*, eds. Daniel Garber and Michael Ayers (Cambridge: Cambridge University Press,) pp. 680-701.

Nadler, Steven. 2011. *Occasionalism: Causation Among the Cartesians* (Oxford: Oxford University Press).

Okruhlik, Kathleen. 1995. "The Status of Scientiac Laws in the Leibnizian System." Pp. 183–206 in *The Natural Philosophy of Leibniz.* Edited by Kathleen Okruhlik and J. R. Brown. Dordrecht: Reidel.

O'Neill, Eileen. 1993. "*Influxus Physicus,*" in Steven Nadler (ed.), *Causation in Early Modern Philosophy* (University Park, PA: Pennsylvania State University Press) 27-55.

Prost, J. 1907. *Essai sur l'atomisme et l'occasionalisme dans la philosophie Cartesienne* (Paris: Paulin).

Rozemond, Marleen. 'Leibniz on Final Causation.' *Metaphysics and the Good: Themes from the Philosophy of Robert Merrihew Adams.* Eds. Samuel Newlands and Larry M. Jorgensen. Oxford: Oxford University Press, 2009.

Rutherford, Donald. 'Leibniz on Spontaneity.' *Leibniz: Nature and Freedom.* Eds. Donald Rutherford and Jan A. Cover. Oxford: Oxford University Press, 2005. 156–80.

——. 'Laws and Powers in Leibniz.' *The Divine Order, the Human Order, and the Order of Nature: Historical Perspectives.* Ed. Eric Watkins. Oxford: Oxford University Press, 2013. 149–74.

Sleigh, R. C. Jr., 1990b, "Leibniz on Malebranche on Causality," *Central Themes in Early Modern Philosophy*, J. Cover and M. Kulstad (eds.). Indianapolis: Hackett Press.

Spinoza, 1925. *Opera.* ed. C. Bebhardt, 4 vols. (Heidelberg: Carl Winter). Suárez, Francisco. 1866. *Disputationes Metaphysicae.* In Charles Berton, ed., Opera Omnia (Vols. 25-26). Vivès.

Watkins, Eric. 1995. "The Development of Physical Influx in Early Eighteenth-Century Germany," *Review of Metaphysics* (49:2): 295-339.

Wilson, Margaret. 1976. "Leibniz's Dynamics and Contingency in Nature." Pp. 264–89 in *Motion and Time, Space and Matter.* Edited by R.

Turnbull and P. Machamer. Columbus: Ohio State University Press. Reprinted in Margaret Wilson. 1999. *Ideas and Mechanism: Essays on Early Modern Philosophy*. Pp. 421–441. Princeton: Princeton University Press.

Woodhouse, R. 1810. *A History of the Calculus of Variations in the Eighteenth Century*, New York 1810

---

[i] "A cause is a principle that per se infuses being into another thing … By the term "per se infusing" privation and all accidental causes, which do not transfer or infuse being into something else per se, are excluded. The word "infusing" is to be understood … in a general sense so that it is equivalent to "giving or communicating being to another thing."

[ii] "it seems with Spinoza to make of God the very nature of things, while created things disappear into mere modifications of the one divine substance, since that which does not act, which lacks active force, which is robbed of discriminability, robbed finally of all reason and basis for existing, can in no way be a substance" (NI 15/AG 165-6)

[iii] "nature, proposing some end to itself, chooses the optimal means"

[iv] "final causes can sometimes also be introduced to great effect in particular problems in physics—not only so that we can better admire the most beautiful works of the supreme Creator, but also sometimes in order to find out things which by consideration only of efficient causes would be less obvious, or only hypothetical" (FW 164).

[v] "A substance is either simple, such as a soul, which has no parts, or it is composite, such as an animal, which consists of a soul and an organic body. But … it is evident that in the end there are simple substances alone, and that in them are the sources of all things" (PM 175)

[vi] "the representation of the end in the soul is the efficient cause of the representation in the same soul of the means"