

Leibniz on the Divine Preformation of Souls and Bodies

Christopher P. Noble, New College of Florida, cnoble@ncf.edu

Abstract: For the mature Leibniz, a living being is a created substance composed of an infinitely complex organic body and a simple immaterial soul. Soul and body do not interact directly, but rather their states correspond according to a harmony preestablished by God. I show that Leibniz's theory faces challenges with respect to the question of whether substances need to possess knowledge of how they bring about their effects, and I argue that to address these challenges, Leibniz turns to a concept of "divine preformation" that he attributes to both soul and body. Insofar as divine preformation provides Leibniz with an explanation for how soul and body can both act without possessing explicit knowledge of what they are doing, it serves a key tool for justifying the theory of preestablished harmony.

Introduction

This paper analyzes the mature Leibniz's use of the concept of divine preformation to explain how created substances can serve as natural causes without possessing explicit knowledge of how they produce their effects.ⁱ For Leibniz, a created substance by nature possesses an extended material body and an immaterial soul, and he explains the correspondence between soul and body by hypothesizing a harmony preestablished by God.ⁱⁱ Rejecting contemporaneous theories that posited forms of mutual influence between soul and body, as well as occasionalist views attributing soul-body interaction to God's causal efficacy, Leibniz held that God creates soul and

body such that their states correspond, yet in such a way that they develop separately and according to their own natures. For Leibniz, this solution neatly avoids recourse to obscure modes of causation between immaterial and material entities, while importantly preserving an active causal role for created beings within nature, a crucial constraint, in Leibniz's view, on any adequate natural philosophical account of the world.

In developing his position, Leibniz faces two challenges related to the question of whether the soul and body need explicit knowledge of the activities they carry out according to the theory of preestablished harmony. First, since the theory maintains that the states of the soul and body mirror each other, does the soul perceive everything that takes place within the body? If so, how does it perceive what takes place in the body, seeing that the body has no influence on the soul? Second, there is the view, defended, for instance, by Leibniz's contemporary Pierre Bayle, that in order to truly bring about an effect, causal agents must possess knowledge of the means and ends involved. Since, according to the theory of preestablished harmony, both souls and bodies are causally responsible for all of their actions, do they therefore need to know how it is that they produce their effects? I argue that Leibniz uses the concept of divine preformation as a tool to provide answers to both of these problems. In other words, Leibniz attributes forms of divine preformation to both body and soul in order to explain how the soul perceives everything taking place within the body and how both soul and body are able to produce effects without possessing knowledge of what they do.

In showing that Leibniz attributes divine preformation to both soul and body, this account aims to contribute to scholarly understanding of Leibniz's views on living beings and vital processes. This aspect of Leibniz's thought has been the subject of growing interest in recent decades (Wilson 1994; Ishiguro 1998; Duchesneau 1998; Smith 2011a, 2011b; Nachtomy 2014),

and scholars have been particularly drawn to Leibniz's mature period account of organic bodies or “machines of nature” (Fichant 2003; Smith 2011, esp. 97–161; Smith and Nachtomy 2011; Arthur 2014, 67–76; Phemister 2016, 66–92). Beginning in the *New System of the Nature and Communication of Substances* of 1695, Leibniz argues that living bodies are infinitely complex mechanisms whose organic structure results from God's design.ⁱⁱⁱ This structure features a “nested” organization insofar as each organ of a living body is a further machine of nature nested in the first, *ad infinitum* (Nachtomy et al. 2002; Nachtomy 2007). For Leibniz, this account of organic body helps explain vital processes; functions as a proof of God's existence insofar as living bodies express God's infinite intelligence and design (Smith and Phemister 2007); and conceptualizes corporeal generation and death as transformative processes of unfolding and diminution (Arthur 2006; Roinila 2016). Moreover, it links Leibniz's theoretical philosophy of nature with larger developments in the history of science including empirical discoveries of seventeenth-century microscopy (Wilson 1995; Smith 2011a, 142–53; Becchi 2017), as well as present-day conceptions of macro-organisms as entities that essentially incorporate a host of micro-organisms (Nachtomy 2009; Huneman 2014). In drawing attention to these features of Leibniz's account of living beings, however, commentators have tended to neglect the theoretical correspondence between this model of the corporeal aspect of the living being and the underlying immaterial aspect or soul. For instance, while scholars have connected Leibniz's conception of divine preformation to his notion of organic body, showing that Leibniz adopted a form of preformation according to which God preforms organic bodies such that they pre-exist fertilization and survive apparent death (Duchesneau 1998, 315–72; Arthur 2006; Smith 2008; Smith 2011, 165–96; Detlefsen 2014, 147–48; Phemister 2015), they have overlooked the fact that Leibniz additionally attributes divine preformation to the simple, immaterial soul, thereby

missing an opportunity to link Leibniz's active engagement with the life sciences to his metaphysics of immaterial substances. A focus on bodily divine preformation is unsurprising as theories of preformation typically attempt to explain physical structures undergoing processes of embryogenesis.^{iv} However, it is important to note way that additionally Leibniz extends the conception of divine preformation to the nature of the simple immaterial soul. Thus, in drawing attention to the way that Leibniz attributes forms of divine preformation to *both* bodies and souls, this paper contributes to recent scholarly interest in Leibniz's vision of living bodies as infinitely complex "machines of nature" by analyzing a specific theoretical application of the divine preformation of the body, as well as showing that this application finds a close theoretical correspondence to the nature of the soul and its own divine preformation. In addition to shedding light on Leibniz's theory of the preestablished harmony of the soul and body, his criticisms of theories of influence and occasionalism, as well as his approach to natural philosophy in general, highlighting Leibniz's application of divine preformation to the soul reveals the close connections between Leibniz's metaphysics and his active engagement with the life sciences.

I begin with a brief account of Leibniz's theory of preestablished harmony between soul and body, as first presented in the *New System*. I show that, Leibniz argues that there is mutual conformity between soul and body insofar as God organizes their natures to unfold in harmony with each other. I then turn to a series of later texts in which Leibniz deploys the concept of divine preformation to counter supporters of influx, on the one hand, and supporters of occasionalism, on the other. These texts include the *Considerations on Vital Principles and Plastic Natures* of 1705, Leibniz's 1709 *Animadversions* against the work of the medical philosopher Georg Ernst Stahl, and the *Theodicy* of 1710, and together they show that Leibniz specifically uses the notion of divine preformation to explain how the soul confusedly perceives

what takes place in the body and how both souls and bodies act spontaneously without possessing explicit knowledge of what they do.

The Preestablished Harmony of Body and Soul

In this section, I examine Leibniz's presentation of the theory of preestablished harmony in the *New System*.^v I show that he frames it as an alternative to two rival theories: those of "influence" and "occasional causes" (O'Neill 1993), and that it leads him to propose that the states of body and soul conform to each other insofar as they each independently produce their actions according to their own laws, yet according to a correspondence organized by God.

In the *New System*, Leibniz rejects two types of answer to the question of how to explain the correspondence between soul and body. The first, which Leibniz refers to as the "system of influence" posits forms of direct influence between body and soul, whereas the second, the "system of occasional causes" makes God responsible for inter-substance causation. For Leibniz, mutual influence between an extended body and an unextended soul is fundamentally unintelligible: "For I could in find no way of explaining how the body can make something pass over into the soul or vice versa, or how one created substance can communicate with another" (WF, 17/GP IV, 483). Occasionalism, by contrast, is, for Leibniz, wholly possible although it is implausible: since occasionalism has God move bodies in accord with souls' volitions, Leibniz claims that it would render God a *deus ex machina* continuously performing miracles. For Leibniz, a miracle is, by definition, an exception to the laws of nature, and hence cannot be explained in natural terms. Leibniz's claim that the occasionalist resorts to a theory of perpetual miracles therefore means that the occasionalist abandons natural explanation altogether and resorts to purely supernatural causes (WF, 17/GP IV, 483; Jolley 2005; Rutherford 2013).

In developing his own alternative account of the correspondence between soul and body, Leibniz outlines a theory of substantial activity. According to this theory, each created substance acts spontaneously by virtue of its own internal nature alone, meaning that Leibniz does not need to explain how one substance could exert some form of causal influence upon another. For Leibniz, a substance receives its unity from a substantial form whose nature consists of an internal force of acting. Significantly, by means of this force, substances possess “something analogous to feeling and desire” (WF, 12/GP IV, 479). This latter point explains how substances move from one state to the next spontaneously and without external input: they strive to pass from one state to the next insofar as their natures determine them to desire particular ends.^{vi} Furthermore, Leibniz argues that God organizes the actions of these created substances in advance. The result is that each substance acts spontaneously by virtue of its own nature, but in a way that harmonizes with the actions of the other substances. In other words, with respect to the actions of a particular substance, “everything in it arises from its own nature [...] and yet with a perfect *conformity* to things outside it” (WF, 17–18/GP IV, 484). Since a substance is responsible for everything that happens to it, Leibniz is able to argue that his own solution does not resort – like the system of occasional causes – to any form of miraculous or supernatural explanation. Rather, once God creates the world, what happens within it is fully explicable in terms of the nature of created things themselves.

Leibniz explains how substantial spontaneity works by pointing to the representational nature of the soul serving as the substance’s substantial form. We have seen that the internal force of a substance is expressed as a type of desire by means of which substances pass from one state to the next. Leibniz characterizes these states themselves as perceptions that represent the organs of the body and its point of view on the rest of the world. Since God has ordered the

perceptions of all substances such that they mutually conform, Leibniz argues that “each of these substances accurately represents the whole universe in its own way and from a particular point of view, and since its perceptions or expressions of external things occur in the soul at just the right time in virtue of its own laws... there will be perfect agreement between all these substances, which produces the same effect as would be observed if they communicated with one another by means of a transmission of species or qualities, such as most ordinary philosophers suppose” (WF, 18/GP IV, 484). Thus, Leibniz provides a solution to the problem of communication of substances that explains substantial activity in terms of the natures of created substances themselves and that does not require God to constantly intervene in an inefficient manner. Rather, God determines everything that is to happen at a single stroke, allowing each substance to develop over time according to its nature.

Leibniz’s account of spontaneity further allows him to explain the union of the soul and body. In place of the alternative theories of influence and occasional causes, Leibniz argues that there is a correspondence between the states of soul and body, even as their activities unfold according to distinct sets of laws. Whereas the soul provides the unity and formal nature of a substance, the body serves as the material aspect that is an aggregate of parts. The body is an infinitely complex organized mass, which Leibniz calls a “machine of nature.” This bodily machine is subject to mechanical laws of efficient cause and effect. By contrast, the soul is a simple, perceiving entity, whose nature is subject to laws of desire or final causality. On Leibniz’s model, the body moves according to mechanical laws at the same time as the soul desires that it move, and the fact that there is mutual conformity between the actions of body and soul creates the appearance of interaction and unity:

Furthermore, the organized mass in which the point of view of the soul lies is more immediately expressed by it, and is in turn ready, just when the soul desires it, to act of itself according to the laws of the bodily mechanism, without either one interfering with the laws of the other, the animal spirits and the blood having exactly at the right moment the motions which correspond to the passions and perceptions of the soul. It is this mutual relationship, arranged in advance in each substance in the universe, which produces what we call their communication, and which alone constitutes the union of soul and body.

(WF, 18/GP IV, 484–85)

The fact that the body moves in the ways desired by the soul and yet as a result of its own corporeal nature provides Leibniz with his solution to the problem of the union of the soul and the body. Even though soul and body do not affect one another directly, what happens in the body is reflected in the soul and vice versa. That the mechanical movements of the body and the spontaneous perceptions of the soul correspond is, from Leibniz's point of view, sufficient to justify the claim that they are united.

If Leibniz's theory of preestablished harmony successfully accounts for the unity of soul and body, it raises a number of further questions related to what forms of knowledge must be possessed by created things in order to carry out their preestablished activities. Since the soul expresses what happens in its body, must it know everything that takes place within it? Further, must the soul and body in some sense know what it is that they are doing? In the following sections, I will argue that in order to respond to these challenges, Leibniz takes recourse to the concept of divine preformation, as applied to both soul and body. As I will show, for Leibniz, divine preformation explains how the soul expresses the body without possessing distinct knowledge of each bodily part and motion, and how soul and body carry out their corresponding

series of actions in the absence of explicit knowledge of what they do. In this way, Leibniz is able to further support the theory of preestablished harmony and its rejection of theories of influence and occasionalism.

The Divine Preformation of Body and Soul

In this section, I analyze the concept of divine preformation as it applies to both body and soul. While commentators typically connect this theory of divine preformation solely to the organic bodies of living beings, I show that Leibniz additionally attributes divine preformation to the soul's series of perceptions by examining a passage from Leibniz's 1709 *Animadversions* to the *Theoria Medica Vera* of Georg Ernst Stahl. In this passage, Leibniz uses divine preformation to explain how the soul confusedly perceives all that happens in the body.

Leibniz develops the notion of divine preformation in the years following the publication of the *New System* in order to help explain the way that God establishes the nature of substances in advance. For instance, in the *Considerations on Vital Principles and Plastic Natures* of 1705, Leibniz attributes a form of divine preformation to the organic body as part of his rejection of Ralph Cudworth's theory of immaterial plastic natures. For Cudworth, as immaterial entities that organize matter into vital form, plastic natures are “a natural agency responsible for shaping matter” (Cudworth 1678, 147). For Leibniz, Cudworth's theory is a version of the system of influence, according to which immaterial entities directly influence and organize matter, and in his criticisms, Leibniz argues that God completely designs and organizes the physical world in advance. Thus, when God creates the world, he does so in such a way that matter is already organized into living form, and the motion of matter are “not at all changed within the order of nature, God having preestablished it as it should be” (L, 586–87/GP VI, 540). In other words,

God creates the natural world such that the organization of matter does not require something like an immaterial plastic nature because it is already organized from the start. Leibniz then identifies this form of organization as a type of *material plastic nature*, such that with regards to Cudworth's plastic natures, he "can say *non mi bisogna, e non me basta*, because this preformation and this infinitely complex organism provide me with material plastic natures that meet the need" (L, 589/GP VI, 544). Whereas Cudworth ascribed the generation of living bodies and vital processes to the action of immaterial plastic natures, Leibniz's preformation allows him to argue that God designs all organic structure in advance. Thus, Leibniz uses the concept of divine preformation to account for vital organization and mechanism while rejecting Cudworth's theory of immaterial plastic natures (Smith and Phemister 2007).

In the *Considerations*, Leibniz associates divine preformation with the material organization of the body. However, according to the theory of preestablished harmony, God orders the activities of both body and soul in advance, and Leibniz will indeed come to maintain that the soul exhibits divine preformation just like the body. For instance, in his 1709 *Animadversions* against the *Theoria Medica Vera* of Georg Ernst Stahl, Leibniz argues that the soul acts according to divine preformation. For Stahl, the soul governs the activities carried out by the bodily organs in the end of maintaining the unity of the living organic body. As he sums up his position in a response to Leibniz: "souls have been given energy in order to act in bodies, on bodies, and through bodies, and to harmonize and construe their bodies with such a mechano-organic reason and proportion that they can satisfy the measure and destination of the activity of their souls" (LS, 189). In other words, according to Stahl, souls are capable of directly affecting bodies—of acting in, on, and through them—in order to fulfill their end of maintaining vital unity. In his rejection of Stahl's position in the *Animadversions*, Leibniz recalls his

criticisms of Cudworth's view that immaterial plastic natures directly organize bodies, and this time attributes divine preformation to the soul as well as the body:

Here the plastic natures come to mind, which formerly philosophers and physicians admitted, and which Cudworth not so long ago resuscitated in his illustrious work, an interpretation of which was provided by the most learned Le Clerc. But they were mistaken who believed that there would be in the soul building its own body, or in I know not what other manufactory supervisor, such a wisdom and power that it could contrive and produce the divine machine of the animal. For the outcome of the artifice is owed to divine preformation. At the same time, it is most true that the soul, equally suited to this work by divine preformation, acts by means of its perception and appetite, as if it formed the body by itself alone, so that if one were able to inspect its interior sufficiently, he might perceive in the soul whatever happens in the formation of the body. (LS, 27)

Though the soul does not actually form the body's mechanical structure, it expresses and represents it by virtue of its own divine preformation: if one examines the soul, one could identify everything that will happen in the body.

If it is clear that Leibniz attributes divine preformation to the soul, in what sense is the soul's nature preformed? In the case of the organic body, divine preformation refers to the way that God orders the body's infinitely complex mechanical structure. What analogue for the body's preformation do we find in the soul? In introducing the soul's divine preformation in the passage in the *Animadversions*, Leibniz refers to the way that the soul acts by means of perception and appetite. In other words, while the divine preformation of the body relates to the body's physical structure, the divine preformation of the soul relates to the arrangement of its series of perceptions and the appetites by means of which it passes from one perception to the

next. While the soul does not perceive the body in a distinct, conscious way in the sense of individually picking out each minute bodily part and motion, Leibniz maintains that it does truly perceive everything occurring within the body. The key point is that the soul perceives what happens in the body *confusedly*, in a way that runs its motions together, analogous to the way that our visual perception mixes individual blue and yellow elements into a general perception of green (LS, 33).^{vii} Further, Leibniz posits a form of appetite or instinct that explains how the soul moves from one confused perception of the total state of its body to the next:

And though the soul is so greatly limited in its distinct concepts that it can neither follow by its intellect this admirable work, nor control it by choice of will, nonetheless by its confused perception, and by the appetite corresponding to this, which along with certain people you may call its “instinct,” it imitates the divine infinity. Thus, nothing happens in the body that the soul does not truly perceive, or toward which it does not make its appetite tend (in which I include, depending on circumstances, the instinct to flee), even if this escapes our attention. (LS, 27)^{viii}

Although we are not distinctly conscious of all that happens in our body, nor capable of willing what happens within it, by means of confused perceptions and appetites, the soul expresses the entirety of the changes taking place within the body. As we saw in the prior passage, Leibniz identifies perception and appetite as the means by which the soul, in accord with divine preformation, carries out its work. Thus, while the body is characterized by divine preformation in the sense that it is an infinitely complex machine of nature, the soul is marked by divine preformation in the sense that its confused perceptions and appetites are ordered, in advance, to represent the body and to unfold alongside the body’s movements.

Divine Preformation in the *Theodicy*

Leibniz further develops his account of the divine preformation of the soul in a passage of the *Theodicy*, his book-length treatment of divine justice published in 1710, this time in the context of his controversy with Pierre Bayle over the latter's occasionalist view that God is the sole cause of natural phenomena. We have already seen that, for Leibniz, occasionalism relies on a supernatural mode of explanation in which God perpetually produces miracles. In the *Theodicy*, Leibniz's additional concern is that Bayle's occasionalism removes of all responsibility from creatures. If created substances are not true natural causes, and all causation takes place as a result of God's activity, then God would be responsible for producing evil. (T, ¶392/GP VI, 348–50). This result is unacceptable, since it "would make God the author of sin" (T, ¶400/GP VI, 353–54), thereby leading to hatred of God. I show that, within this context, Leibniz draws on the concept of divine preformation in order to reject one of Bayle's main arguments for occasionalism, namely that in order for a cause to be a cause, it must possess knowledge of how it produces its effects.^{ix} Divine preformation thus helps Leibniz strengthen his rejection of occasionalism insofar as it explains how bodies and souls are capable of acting as causes without distinct knowledge of what it is that they do.

Leibniz begins by laying out what he calls "foundation" of Bayle's argument in *Theodicy* ¶401. Leibniz quotes a passage from Bayle's *Réponse aux Questions d'un Provincial* where Bayle makes the following two claims: we do not know how it is that our ideas come about, and when it comes to end-directed tasks such as sewing we acknowledge that we need to have knowledge of how to form the proper stitches. As Bayle writes in the quoted passage, "where is the man who knows not on the one hand that he is in absolute ignorance as to how ideas are made, and on the other hand, that he could not sew two stitches if he were ignorant of how to

sew?" (Bayle 1706, 767; Quoted in T, ¶401/GP VI, 354). Bayle illustrates this point with the example of a mental image of a rose formed after we encounter one with our eyes. According to Bayle, sewing two stitches is simpler than producing the idea or mental portrait of a rose, so if we admit that we need to know how to stitch in order to actually produce the effect of sewing, it should be the same in the case of a producing the more complicated mental image. In other words, just as we cannot sew unless we know how, we ought not be able to produce the image of a rose without knowledge of how to do so. Indeed, according to Bayle, "the true efficient cause of an effect must know the effect, and be aware also of the way in which it must be produced" (Bayle 1706, 768; Quoted in T, ¶402/GP VI, 355). Thus, insofar as we acknowledge that we do know how it is that our ideas, for instance the mental images we have of physical objects, are formed, we should admit that we cannot be their true efficient cause, and thus are not responsible for their formation.

Bayle also applies this reasoning to the will, using it to explain our frequent inability to choose what we actually think and do. Often when we will to act in one way, for instance to resist a tempting morsel of food, we nevertheless act in a way that contradicts this desire. Further, we involuntarily experience memories, as when we are reminded, perhaps painfully, of embarrassing situations from our past. Bayle does not interpret these cases as resulting from weakness of will. Rather, he takes our inability to bring about a desired activity as resulting from a failure of our knowledge:

Now if we examine ourselves well we shall be strongly convinced, (1) that, independently of experience, our soul is just as little aware of what a volition is as of what an idea is; (2) that after a long experience it is no more fully aware of how volitions are formed than it was before having willed anything. What is one to conclude from that,

save that the soul cannot be the efficient cause of its volitions, any more than of its ideas, and of the motion of the spirits which cause our arms to move? (Bayle 1706, 769; Quoted in T, ¶402/GP VI, 355–56)

For Bayle, there is a clear upshot to this argument that if we do not know to bring about our ideas and volitions, then we cannot be their true efficient cause: namely, we should admit that we receive our ideas and volitions passively as a result of God's activity.

To counter Bayle's argument, Leibniz begins by denying the premise that for physical bodies to be true efficient causes, they need to be aware of the means whereby they bring about their effects. While agreeing with Bayle that an action like sewing requires knowledge since “one acts for an end, one must be aware of the means” (T, ¶403/GP VI, 356), Leibniz distinguishes between such end-directed activities and other natural activities – both animate and inanimate – that occur without reflection on means and ends. Dismissing Bayle's view that all efficient causality requires knowledge of effects as a “strange way of reasoning,” Leibniz asks “[w]hat necessity is there for one always to be aware how that which is done is done? Are salts, metals, plants, animals and a thousand other animate or inanimate bodies aware how that which they do is done, and need they be aware? Must a drop of oil or of fat understand geometry in order to become round on the surface of water?” (T, ¶403/GP VI, 356). Leibniz's point is that these activities are simply not the types of activities that require the efficient cause to possess knowledge of means and ends. Unlike one's failure to patch a garment if one lacks the knowledge of how to sew, the drop of oil becomes round on the surface of water whether it understands geometry or not. These processes are caused by the nature and structure of the physical bodies in question, not from a deliberative process involving a reflection upon means and ends.

What about, however, cases involving the production of complex, functionally adaptive physical form, as in organic bodies?^x Insofar as these cases require the selection of materials for the sake of specific ends, does Bayle's argument hold for them? Leibniz argues that these cases can be explained by means of a form of unknowing activity or instinct that he identifies with divine preformation: “[t]he foetus forms itself in the animal, and a thousand other wonders of nature are produced by a certain *instinct* that God has placed there, that is by virtue of *divine preformation*, which has made these admirable automata, adapted to produce mechanically such beautiful effects” (T, ¶403/GP VI, 356). Thus, for Leibniz, organic bodies carry out physical activities according to their divine preformation. While these activities involve the intentional selection of means and ends insofar as they were initially formed by God's design, the efficient causal process itself does not require such knowledge insofar as it is realized by the mechanical structure of the organic body or automaton. Thus, the key difference between Leibniz and the Baylesian occasionalist lies in the fact that for Leibniz, the efficient cause does not need distinct knowledge of the relevant means and ends and hence can be located in the nature qua mechanical structure of the creatures themselves.

Leibniz then extends this account of the body's causal activity to that of the soul. Just as the bodily automaton can produce effects that it does not understand by means divine preformation, the soul is likewise the cause of its ideas and volitions according to divine preformation: “Even so it is easy to believe that the soul is a spiritual automaton still more admirable, and that it is through divine preformation that it produces these beautiful ideas, wherein our will has no part and to which our art cannot attain” (T, ¶403/GP VI, 356). Whereas God arranges the body's mechanical parts to move according to a preordained efficient causal process, God arranges for the soul's ideas and perceptions to unfold according to a

predetermined final-causal series. Here the soul's activity does not depend upon the material organization of parts; rather, as in the *Animadversions* against Stahl, it involves the internal relations of its perceptions and appetitions. While these perceptions are ordered such that they unfold according to divine preformation and without the intervention of the soul's knowledge or volition, nevertheless, on Leibniz's account, the soul counts as the true cause of perceptions that it experiences.

As is evident from this passage in the *Theodicy*, divine preformation functions as a conceptual tool for Leibniz to reject Bayle's argument that causes must possess knowledge of the means and ends relevant for a particular effect. Further, he applies the concept of divine preformation in discussing both the soul and body: both are disposed by divine preformation to perform a specific sequence of causal activities without explicitly knowing what it is that they are doing. In this way, he avoids – at least to his own satisfaction – having to adopt a theoretical account of nature in which God is the author of sin.

Conclusion

In developing his account of the theory of preestablished harmony in the wake of the *New System*, Leibniz attributes forms of divine preformation to both body and soul. The concept of divine preformation strengthens Leibniz's theory of preestablished harmony as an alternative to the competing systems of influence and occasional causes. Not only does it provide Leibniz with a tool to argue that God organizes the natures of body and soul in advance such that they act spontaneously of their own natures yet in conformity with each other, but he uses it to explain how the soul can possess confused perceptions of everything taking place within the body and to reject the occasionalist argument that causes must possess knowledge of how they bring about

their effects. The notion of divine preformation, capturing the way that God organizes the nature and structure of soul and body in advance, allows Leibniz to explain how the mechanical structure of the body and the perceiving nature of the soul each carry out a predetermined series of actions without requiring conscious knowledge or reflection. Thus, it constitutes an important feature of Leibniz's claim that there exists a preestablished harmony between soul and body, and highlights the close theoretical connection of Leibniz's understanding of the organic body of a substance as a machine of nature and that of the corresponding soul.

Abbreviations:

A: 1923–. *Sämtliche Schriften und Briefe*. Ed. Deutsche Akademie der Wissenschaften. Berlin: Akademie Verlag. Cited by Series, Volume, Page Number.

AG: 1989. *Philosophical Essays*. Trans. Roger Ariew and Daniel Garber. Indianapolis: Hackett.

GP: 1875. *Die Philosophischen Schriften*. Ed. C. J. Gerhardt, Ed. (Vols. 1–7). Berlin: Weidmann. Cited by Volume, Page Number.

L: 1969. *Leibniz: Philosophical Papers and Letters*. Ed. Leroy E. Loemker, Ed. (Second Edition). Dordrecht: Reidel.

LS: 2016. *The Leibniz-Stahl Controversy*. Trans. and ed. François Duchesneau and Justin E. H. Smith. New Haven and London: Yale University Press.

NE: 1996. *New Essays on Human Understanding*. Ed. Peter Remnant and Jonathan Bennett. Cambridge: Cambridge University Press.

T: 1985. *Theodicy*. Trans. E. M. Huggard. La Salle, IL: Open Court. Cited by Paragraph Number.

WF: 1997. *Leibniz's 'New System' and Associated Contemporary Texts*. Trans. and Ed. Roger S. Woolhouse and Richard Francks. Oxford: Oxford University Press.

References

Antognazza, Maria Rosa 2009. *Leibniz: An Intellectual Biography*. Cambridge.

Arthur, Richard T. W. 2006. “Animal Generation and Substance in Sennert and Leibniz.” In *The Problem of Animal Generation in Early Modern Philosophy*, ed. Justin E. H. Smith, 147–74. Cambridge: Cambridge University Press.

———. 2014. *Leibniz*. Cambridge: Polity Press.

Bayle, Pierre. 1706. *Réponse aux Questions d'un Provincial, Tome Troisième*. Rotterdam: Reinier Leers.

Becchi, Alessandro. 2017. “Between Learned Science and Technical Knowledge: Leibniz, Leeuwenhoek and the School for Microscopists.” In *Tercentenary Essays on the Philosophy and Science of Leibniz*, ed. Lloyd Strickland, Erik Vynckier, and Julia Weekend, 47–79. Palgrave Macmillan.

Bolton, Martha B. 2013. “Change in the Monad.” In *The Divine Order, the Human Order, and the Order of Nature, Historical Perspectives*, Ed. Eric Watkins. Oxford, 174–94

Bowler, Peter. J. 1971. “Preformation and Pre-Existence in the Seventeenth Century: A Brief Analysis.” *Journal of the History of Biology* 4: 221–44.

Cheung, Tobias. 2006. “From the Organism of a Body to the Body of an Organism: Occurrence and Meaning of the Word ‘Organism’ from the Seventeenth to the Nineteenth Centuries.” *British Journal for the History of Science* 39: 319–39.

Cudworth, Ralph. 1678. *The True Intellectual System of the Universe*. London: Printed for Richard Roytson.

Duchesneau, François. 1998. *Les Modèles du vivant de Descartes à Leibniz*. Paris: Vrin.

Fichant, Michel. 2003. Leibniz et les machines de la nature. *Studia Leibnitiana*, 35 (1), 1–28.

Garber, Daniel. 2009. *Leibniz: Body, Substance, Monad*. Oxford: Oxford University Press.

Ishiguro, Hide. 1998. “Unity without Simplicity: Leibniz on Organisms.” *The Monist*, 81 (4) 534–52.

Geulincx, Arnold. 1999. *Metaphysics*. Trans. Martin Wilson. Cambridgshire: Christoffel Press.

Huneman, Philippe. 2014. “Kant vs. Leibniz in the Second Antinomy; Organisms are not Infinitely Subtle Machines.” *Kant-Studien*, 105(2), 155–95.

Jolley, Nicholas. 2005. “Leibniz and Occasionalism.” In *Leibniz: Nature and Freedom*. Ed. Donald Rutherford and Jan A. Cover. Oxford: Oxford University Press. 121–34.

Jorati, Julia. 2015. “Three Types of Spontaneity and Teleology in Leibniz.” *Journal of the History of Philosophy* 53, 669–98.

———. 2017. *Leibniz on Causation and Agency*. Cambridge: Cambridge University Press.

Malebranche, Nicholas. 1997. *The Search after Truth*. Trans. and ed. Thomas M. Lennon and Paul J. Olscamp. Cambridge; New York: Cambridge University Press.

Nachotomy, Ohad. 2007. “Leibniz on Nested Individuals.” *British Journal for the History of Philosophy* 15 (4), 709–28.

———. 2009. “Leibniz and the Logic of Life.” *Studia Leibnitiana* 41 (1), 1–21.

———. 2011. “Leibniz on Artificial and Natural Machines: or What it Means to Remain a Machine to the Least of its Parts.” In *Machines of Nature and Corporeal Substances in Leibniz*, ed. Justin. E. H. Smith and Ohad. Nachotomy, 61–80. Dordrecht: Springer.

Nachtomy, Ohad, Ayelet Shavit, and Justin E. H. Smith. (2002). “Leibnizian Organism, Nested Individuals, and Units of Selection.” *Theory in Biosciences*, 12(2), 205–230.

O’Neill, Eileen. (1993). “Influxus Physicus.” In *Causation in Early Modern Philosophy*, ed. Steven Nadler, 27–55. State College: Penn State University Press.

Phemister, Pauline. 2005. *Leibniz and the Natural World: Activity, Passivity, and Corporeal Substances in Leibniz’s Philosophy*. Dordrecht.

———. 2011. “Monads and Machines.” In *Machines of Nature and Corporeal Substances in Leibniz*, ed. Justin. E. H. Smith and Ohad Nachtomy, 39–60. Dordrecht: Springer.

———. 2016. *Leibniz and the Environment*. Abingdon, Oxon: Routledge.

Pyle, Andrew. 2003. *Malebranche*. London: Routledge.

Roinila, Markku. 2016. “The ‘Death of Monads: G. W. Leibniz on Death and Anti-Death.’” *Death and Anti-Death, vol 14: Four Decades after Michael Polanyi, Three Centuries after G. W. Leibniz*, ed. Charles Tandy, 243–66. Ann Arbor: RIA University Press.

Rutherford, Donald. 2005. “Leibniz on Spontaneity.” In *Leibniz: Nature and Freedom*. Ed. Donald Rutherford and Jan. A. Cover. Oxford, 156–80.

———. 2013. “Laws and Powers in Leibniz.” In *The Divine Order, the Human Order, and the Order of Nature, Historical Perspectives*. Ed. Eric Watkins. Oxford, 149–74.

Smith, Justin. E. H. 2009. “A Mere Organical Body, Like a Clock; Organic Body and the Problem of Idealism in the Late Leibniz.” *Eighteenth-Century Thought*, 4, 87–109.

———. 2011. *Divine Machines: Leibniz and the Sciences of Life*. Princeton, NJ: Princeton University Press.

Smith, Justin. E. H and Pauline Phemister. 2007. “Leibniz and the Cambridge Platonists: the Debate over Plastic Natures.” In *Leibniz and the English-Speaking World*, ed. Pauline Phemister and Stuart Brown, 95–110. Dordrecht: Springer.

Smith, Justin. E. H. and Ohad Nachtomy (Eds.) 2011. *Machines of Nature and Corporeal Substances in Leibniz*. Dordrecht: Springer.

Wilson, Catherine. 1994. “Leibniz and the Logic of Life.” *Revue Internationale de Philosophie*, 48 (188), 237–53.

———. (1995). *The Invisible World: Early Modern Philosophy and the Invention of the Microscope*. Princeton: Princeton University Press.

Acknowledgments: I thank Han Thomas Adriaenssen, an audience at the 2018 meeting of the International Society for the History of Philosophy of Science, and two anonymous referees for comments and suggestions on earlier versions of this paper.

ⁱ For the purposes of this paper, I am treating Leibniz’s “mature” period as beginning around 1695, corresponding to the publication of the *New System* and the first part of the *Specimen Dynamicum*.

ⁱⁱ The question of whether Leibnizian bodies are *real* or merely *phenomenal* is highly contested within the literature. For the purposes of this paper, I bracket the question of whether substances possess real bodies throughout Leibniz’s mature period (Phemister 2005; Smith 2011) or if Leibniz moves towards a monadological metaphysics solely involving immaterial simple substances around 1700 (Garber 2009, 335–49).

ⁱⁱⁱ Within the seventeenth century context, terms such as “organism” and “organic” did not refer to individual living beings, but rather to the organized structure exhibited by living beings. In

this sense, a body’s “mechanical” structure can also be “organic” (Wilson 1994; Cheung 2006; Smith 2009; Duchesneau 2014).

^{iv} The theory of preformation emerged in early modern debates on the generation of living beings and represents the view that a living being develops from preformed structures in the egg or sperm. Scholars have come to distinguish *preformation* from *preexistence*. On the former view, there exists a preformed structure from which the later animal emerges; on the latter, the animal structure already exists in the form that it will later take already, albeit in a miniature form (Bowler 1971; Pyle 2003).

^v The term “preestablished harmony” does not appear in the *New System* itself, and Leibniz first uses it in April 1696 (Antognazza 2009, 351). An earlier version of the idea that the states of substances correspond even though they do not interact directly may be found in the “theory of concomitance” that Leibniz outlines in his correspondence with Arnauld in the mid-1680s (L, 337–38/A II.2, 81–82). I thank an anonymous referee for this point.

^{vi} There has been considerable debate on how to understand Leibniz’s doctrine of spontaneity in recent years, in particular since it commits Leibniz to the view that substances spontaneously desire and produce what would appear to be subjectively involuntary and undesirable perceptual states such as those involving pain (Rutherford 2005; Bolton 2013; Jorati 2015, 2017).

^{vii} Leibniz also uses the example of green being composed of a mixture of blue and yellow elements in the roughly contemporaneous *New Essays* of 1710 (NE, 120–21/A VI.6, 120–21). I thank an anonymous referee for this point.

^{viii} While Leibniz identifies the soul’s preformed appetites with a form of “instinct” in the *Animadversions*, in a later text titled *Against Barbaric Physics*, he associates notions of “instinct” with unintelligible influences between soul and body (AG, 319), suggesting that

“instinct” is not a term that Leibniz consistently associates with a substance’s spontaneous nature and divine preformation. I thank an anonymous referee for indicating this passage.

^{ix} This argument—known as the argument “quod nescis”—also figures in the work of other early modern occasionalist philosophers. It plays a central role, for instance, in the work of the Flemish philosopher Arnold Geulincx (1999, 34–36), and in Malebranche’s, *The Search After Truth* (1997, 450).

^x This claim is not as limited in scope as it may appear. Indeed, one of the key insights of the growing literature on organic bodies and machines of nature in Leibniz is that all physical activity reduces to the actions of organic bodies. As Justin E. H. Smith has shown, this result follows from the fact that living beings serve as the basic building blocks of Leibniz’s ontology (2011). In other words, the structures of inorganic bodies reduce to underlying organic bodies at a more fundamental level, not vice versa.