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## Laws and Powers in Leibniz

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Laws and powers vie for theoretical primacy in Leibniz's philosophy. The concept of law is basic to Leibniz's understanding of the order of nature and of God's providential direction of creation. At the same time, Leibniz holds that natural laws themselves must be explained in terms of natural powers: intrinsic sources of activity from which instances of change arise. This is true both for prototypical physical laws (e.g. laws of motion, laws of optics) and for the law of the series that is the ground of the identity of an individual substance. In brief, nothing happens in Leibniz's world except through the activity of powers intrinsic to substances. This is a fundamental point, on which he distinguishes his philosophy from those of Descartes, Malebranche and Spinoza.

The activity of powers is an underexplored topic in the Leibniz literature. Leibniz clearly believes that powers constitute a causal ground floor, and thus are to be appealed to in explaining why change occurs at all in nature. But how exactly do powers act for Leibniz? One possibility is that powers act via laws. One reason why this explanation is tempting is because for Leibniz there is no room for the activation of powers. Powers are not, as they are for Aristotle, potentials for action. They are fully complete and actual sources of activity, in Leibniz's term, *entelechies*. Furthermore, a substantial power can be influenced by nothing outside of itself. So, to the extent that particular actions and instances of change follow from it, this can occur only through a

principle internal to the power. Yet what could this principle be but a law that is no less intrinsic to the substance than the power itself?

If this is correct, then laws presuppose powers, but powers equally presuppose laws. On Leibniz's account the one cannot be present without the other, and they are equally basic from an explanatory point of view. The first two sections of this essay summarize some central themes of Leibniz's account of the laws of nature and his thesis that laws must be grounded in powers. The third and fourth sections examine the mode of activity of powers and the sense in which this activity presupposes the idea of law. I conclude with a hypothesis about the identity of the laws implicated in Leibniz's account of substantial change. Surprisingly, I argue, these turn out to include the very physical laws that give rise to his claim for a metaphysical grounding of laws in substantial powers.

## 1. Laws of Nature

Investigations of the content and justification of the laws of nature have a prominent place in Leibniz's thought. From his earliest writings on natural philosophy, Leibniz is eager to establish the correct form of the laws of nature and to supply adequate theoretical bases for them. This is especially true for the laws of motion and collision, including his famous principle of the conservation of force, and the laws of optics (reflection and refraction). Leibniz is also concerned, however, with the metaphysical and theological import of the laws of nature. What exactly is the ontological status of these laws? Do they represent explanatory bedrock in our theorizing about nature? How are they to be understood in relation to God's providential design and causal contribution to creation? In what follows, I will be concerned more with these general

philosophical issues and less with Leibniz's analysis of particular laws of nature, though some of the results of the latter will be presupposed in what I say.<sup>1</sup>

Leibniz takes for granted that nature is orderly, or lawful, and that it owes its order to God. In the *Discourse on Metaphysics*, he asserts that "in whatever manner God might have created the world, it would always have been regular and in accordance with a certain general order," because "God does nothing which is not orderly" (DM 6; A VI.4, 1537-8/AG 39). There is, most fundamentally, a law that governs creation as a whole, and this "most general of God's laws, the one that rules the whole course of the universe, is without exception" (DM 7; A VI.4, 1539/AG 40). The existence of a single law comprehending all events in the created world is notable in itself and highlights Leibniz's conception of God as a perfect intelligence, who encompasses in thought a complete representation of the causal order of the actual world and of every other possible world.

Under this most general law fall both God's ordinary and extraordinary volitions (DM 6). God's ordinary volitions are coextensive with the order of nature. "Natural operations," Leibniz writes, "are called natural because they are in conformity with certain subordinate maxims that we call the nature of things" (DM 7; A VI.4, 1538/AG 40). Events that are exceptions to these subordinate maxims are by definition miracles, ascribed to extraordinary (or particular) divine volitions (DM 16-17).

In the *Discourse*, Leibniz offers as an example of a subordinate maxim, or law of nature, his principle, argued for against the Cartesians, "that God always conserves the same force but not the same quantity of motion" (DM 17; A VI.4, 1556/AG 49). Supposing that Leibniz is correct in taking this to be a genuine law of nature, which is owed to God's general volition always to preserve the same moving force in interactions among bodies, how are we to

understand the basis in God's will for this law? There seem to be three possibilities: (1) the law follows necessarily from God's nature (though this cuts against the idea that the law depends upon a free divine volition); (2) the law is an arbitrary creation of God's will; (3) the law is the product of a volition that is directed toward a particular end: God wills a given law and not another in order to achieve an optimal outcome. As is well known, Leibniz argues strongly in favor of the third option. Rehearsing his discovery of the "true laws of motion" in the *Theodicy*, he writes:

These considerations make it plain that the laws of Nature regulating movements are neither entirely necessary nor entirely arbitrary. The middle course to be taken is that they are a choice of the most perfect wisdom. And this great example of the laws of motion shows with the utmost clarity how much difference there is between these three cases, to wit, firstly *an absolute necessity*, metaphysical or geometrical, which may be called blind, and which does not depend upon any but efficient causes; in the second place, *a moral necessity*, which comes from the free choice of wisdom in relation to final causes; and finally in the third place, *something absolutely arbitrary*, depending upon an indifference of equipoise, which is imagined, but which cannot exist, where there is no sufficient reason either in the efficient or in the final cause. Consequently one must conclude how mistaken it is to confuse either that which is absolutely necessary with that which is determined by the reason of the best, or the freedom that is determined by reason with a vague indifference. (T 349; GP VI 321/H 334)

Leibniz identifies two essential properties of the laws of nature. First, they are not metaphysically or geometrically necessary, as he takes Spinoza to claim, but contingent. The

laws of motion cannot be derived from the concepts of extension or matter alone; other laws are equally conceivable and consistent with those concepts. But the laws of nature also are not “absolutely arbitrary.” The laws themselves evidence signs of “fitness,” or optimality. The order they dictate for the world suggests that they are “a choice of the most perfect wisdom.” While both of these features of the laws of nature, contingency and fitness, can be supported by arguments based on the form of the laws themselves, Leibniz’s deepest reason for thinking of the laws of nature in this way is his conception of God as a perfectly “intelligent and free being,” who acts for the sake of the best. To think of the laws of nature as either necessary or arbitrary would be to challenge this fundamental assumption about the correct understanding of God’s nature. For Leibniz, the laws of nature “do not arise entirely from the principle of necessity, but rather from the principle of perfection and order,” *because* “they are an effect of the choice and the wisdom of God” (T 345; GP VI 319/H 332).<sup>2</sup>

The presumptive fitness of the laws of nature, expressed in rules such as the equality of cause and effect and the “most determined path principle” in optics, supplies a heuristic for scientific discovery.<sup>3</sup> We are directed to search for rules with these sorts of formal characteristics, because they are most likely to represent fundamental laws of nature. More important than this, however, laws that can be explicated in terms of the “principle of perfection and order” support a conception of the world as one that has been created by God as the best of all possible worlds. Thus, Leibniz’s interpretation of the laws of nature forms an integral part of his theodicy: God chooses the laws of nature as a way of realizing the overarching goal of creating the world of greatest total perfection.<sup>4</sup>

## 2. From Laws to Powers

Everything that has been said so far about the formal properties of the laws of nature is consistent with a broadly Malebranchean understanding of them. Malebranche, as much as Leibniz, believes that the laws of nature express “general volitions” of God, and that these volitions are directed toward a certain end or good. In the laws he wills, God is not constrained by necessity and he does not will arbitrarily. For both philosophers, God wills the laws he does, because they are the *best* (though Malebranche and Leibniz understand this criterion differently).<sup>5</sup>

Leibniz, however, stresses a further characteristic of the laws of nature which distinguishes his position from that of Malebranche. For Leibniz, God’s general volition, or his will that the world unfold according to one order rather than another, is not sufficient for the determination of a law of nature. A law of nature exists only if that law is grounded in the natural powers of created beings. In Leibniz’s view, this further condition is necessary in order to distinguish the natural and the miraculous. If this distinction is left to depend, as it does for Malebranche, on a difference merely in the generality of God’s volition, then we are left with no coherent notion of an independent order of nature. This leads to Leibniz’s famous complaint that Malebranche’s occasionalism amounts to a system of perpetual miracles. Replying to Bayle, Leibniz writes:

[L]et us see whether the system of occasional causes does not in fact assume a perpetual miracle. Here it is said that it does not, because according to this system God would only act through general laws. I agree, but in my opinion this does not suffice to remove the miracles; even if God should do this continuously, they would not cease being miracles, taking this word, not in the popular sense of a rare and marvelous thing, but in the philosophical sense of what exceeds the

powers of created things. It is not enough to say that God has made a general law; for besides this decree there must be a natural means of executing it; that is, it is necessary that what happens can be explained through the nature that God gives to things. (GP IV 520/L 494)<sup>6</sup>

Leibniz's desire to establish a sharp distinction between the ordinary course of nature, which can be understood through the natures of created beings, and genuine miracles is evident. Less clear is whether he has a non-question-begging argument against Malebranche's position. There is no doubt that Malebranche upholds a distinction between the natural and the miraculous that is consistent with his own theory of occasional causation. The problem is that Leibniz does not accept that theory of causation, and so does not accept the account of the natural/miraculous distinction that Malebranche builds on it.<sup>7</sup>

Here I want to focus on Leibniz's own conception of the order of nature. We find this articulated in two complementary lines of argument. The first is premised on a claim about the *intelligibility* of the natural order. Leibniz's commitment to the principle of sufficient reason entails that for anything that happens, there is a sufficient reason why it happens thus and not otherwise. A further necessary condition for an effect to be part of the order of nature, however, is that there be not just some sufficient reason why it happens, but that there be what Leibniz calls a "natural reason": a reason that displays the effect in question as following in an intelligible manner from the nature of some created being (GP III 519). As Leibniz comments in the Preface to the *New Essays*:

But to explain myself distinctly, it must be borne in mind above all that the modifications which can occur to a single subject naturally and without miracles must arise from limitations and variations of a real genus, i.e. of a constant and

absolute inherent nature. For that is how philosophers distinguish the modes of an absolute being from that being itself; just as we know that size, shape and motion are obviously limitations and variations of corporeal nature [...]. Whenever we find some quality in a subject, we ought to believe that if we understood the nature of both the subject and the quality we would conceive how the quality could arise from it. 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. (RB 66)

Leibniz relates this requirement of the intelligibility of the natural order to a strong claim about the agreement between natural occurrences and the human mind's capacity to understand those occurrences. In the same Preface, he writes:

I acknowledge that we must not deny what we do not understand, but I add that we are entitled to deny (within the natural order at least) whatever is absolutely unintelligible and inexplicable [...] [A]lthough what creatures conceive is not the measure of God's powers, their 'conceptivity' or power of conceiving is the measure of nature's power: everything which is in accord with the natural order can be conceived or understood by some creature. (RB 65)

That nature must be such as to be conceivable by the human mind, and conceivable in just the way Leibniz lays out, might seem mere wishful thinking on his part. It is important, therefore, to recognize how this claim is integrated into the structure of his theodicy, according to which God is represented as a perfect intelligence, who has chosen this world for existence in part *because* it is intelligible to rational beings. The intelligibility of the natural order is thus



partly constitutive of this being the best possible world, or the world of greatest perfection. For this reason, Leibniz insists that to reject the “distinction between what is natural and explicable and what is miraculous and inexplicable [...] would be to renounce philosophy and reason, giving refuge to ignorance and laziness by means of an irrational system [...] [T]his idle hypothesis would destroy not only our philosophy which seeks reasons but also the divine wisdom which provides them” (RB 66).<sup>8</sup>

The principle of the intelligibility of nature is a powerful tool that Leibniz wields against Malebranche’s occasionalism, Newton’s theory of universal gravitation, Locke’s doctrine of thinking matter, and any other hypothesis which involves an ad hoc grafting of “occult qualities” or powers onto material things in an attempt to explain particular phenomena or effects.<sup>9</sup> This style of critical argument, however, highlights the need to understand better how Leibniz himself envisions accounting for natural phenomena, and the laws that govern such phenomena, in terms of the natures of created beings. Pursuing this question leads us beyond the initial idea of the intelligibility of nature to consider more closely the *causal* grounds of physical phenomena: By virtue of what in the nature of a body does such-and-such an effect occur? Again, the presumption is that to account for effects, it is not enough simply to cite a law according to which they occur. We must also be able to point to some fact about the nature of the subject of the effect, which explains how and why that effect occurs as it does.

A dominant theme of Leibniz’s philosophy from the late 1670s onward is that this explanatory work cannot be accomplished if we limit ourselves to the understanding of nature presupposed by the mechanical philosophy—an understanding according to which the properties of bodies are limited to extension and its passive modifications (including solidity or impenetrability). There is much to say on this topic. Here we need accept only two points.<sup>10</sup> First,

according to Leibniz, the nature of body, as conceived by the mechanical philosophy, is inadequate to explain the effects observed in the motion and collision of bodies. In particular, the fundamental law of the conservation of motive force (*vis viva*) cannot be accounted for if the nature of body is limited to extension and its passive modifications. Second, Leibniz denies that any explanation of natural phenomena in terms of physical forces alone can be fundamental from a metaphysical point of view. This is because any changing instance of force presupposes a ground in some enduring principle of force or power, which Leibniz identifies as the nature of substance.<sup>11</sup> Consequently, all explanations of natural change must terminate in an account of how those changes occur through the exercise of powers intrinsic to substances. That is the ultimate reason why anything happens as it does in nature.

A characteristic statement of Leibniz's reasoning on this topic appears in the *Specimen dynamicum* of 1695. After reflecting on the inadequacy of his original conception of body, he writes:

I found a proof that something more than magnitude and impenetrability must be assumed in body, from which an interpretation of forces may arise. By adding the metaphysical laws of this factor to the laws of extension, there arise those rules of motion which I would call systematic—namely that all change occurs gradually, that every action involves a reaction, that no new force is produced without diminishing the earlier force [...], and that there is neither more nor less power in the effect than in the cause. Since this law is not derived from the concept of mass [*molis*], it must follow from something else which is in bodies, namely, from the force itself, which always preserves the same quantity, even though it is used by different bodies. I concluded, therefore, that besides purely mathematical

principles subject to the imagination, there must be admitted certain metaphysical principles perceptible only by the mind and that a certain higher and, so to speak, formal principle must be added to that of material mass [*massae materiali*] [...]. Whether we call this principle form, entelechy, or force does not matter provided that we remember that it is explained intelligibly only through the concept of forces. (GM VI 241-2/L 440-1)

Leibniz's argument draws both on the general principle of the intelligibility of nature and the specific claim that certain physical effects demand a ground in a principle of force or power. The true laws of motion, particularly the conservation of force, cannot be explained in terms of the concepts of extension and impenetrability alone. Hence, something more than this must be present in the nature of body, a "formal" or "metaphysical" principle, which is "perceptible only by the mind." The link to intelligibility is made explicit in the opening of the *Specimen dynamicum*:

We have suggested elsewhere that there is something besides extension in corporeal things; indeed, that there is something prior to extension, a natural force everywhere implanted by the Author of nature [...]. But if we cannot ascribe it to God by some miracle, it is certainly necessary that this force be produced by him within bodies themselves. Indeed, it must constitute the inmost [*intimam*] nature of the body, since it is the character of substance to act, and extension means only the continuation or diffusion of an already presupposed acting and resisting substance. (GM VI 235/L 435)

The claim that there be a "natural force everywhere implanted" in bodies leads directly to the conclusion that this force constitutes the "inmost nature" of bodies. Connecting these two ideas

is the axiom that substance, the most basic form of reality, is the only intrinsic source of activity. If bodies are real, Leibniz believes, their existence must be explicated in terms of the existence of substance. From this it is a short step to conclude that if force belongs to the nature of body, then that force is just the force of whatever substances ground the body's existence.<sup>12</sup>

The relationship between the physical force of bodies and the force or power constitutive of substance is fundamental to Leibniz's philosophy. One of the hurdles to comprehending this relationship is Leibniz's assertion that substantial force or power is to be interpreted in broadly Aristotelian terms as soul or substantial form. Again, in the *Specimen dynamicum*, he writes:

*Active force* (which might not inappropriately be called *power* [*virtus*], as some do) is twofold, that is, either *primitive*, which is in all corporeal substance as such [...] or *derivative*, which is exercised variously, as it were by a limitation of primitive force, resulting from the collision of bodies with one another. Indeed, primitive force (which is nothing but the *first entelechy*) corresponds to *soul or substantial form*. But, for that reason, it pertains only to general causes, which are insufficient to explain the phenomena. And so we agree with those who deny that we should appeal to forms when treating the individual and specific causes of sensible things. This is worth pointing out, so that when we restore forms, as if by birthright, in order to uncover the ultimate causes of things, at the same time we don't seem to want to revive the empty wordplay of the common schools.

Nevertheless, a conception of forms is necessary for philosophizing properly (GM VI 236/AG 119; trans. modified)

Leibniz conceives of substantial power, or primitive active force, as essential to the nature of body, and as grounding the forces exerted by bodies in motion and collision. Yet he

denies that this force, as soul or substantial form, can be appealed to in providing explanations of particular physical phenomena. Distancing himself from scholastic Aristotelians, and from those who “bring forth attractive, retentive, repulsive, directive, expansive, and contractive faculties” as the proximate causes of phenomena (GP VII 338/AG 313), Leibniz allies himself with the research program of the mechanical philosophy, while also marking out what he takes to be its explanatory limits. As he succinctly puts it, we must suppose “that everything happens mechanically in nature, but that the principles of mechanism are metaphysical” (GP VII 343-4/AG 319).

The distinction Leibniz draws here allows us to contrast the implications he sees as following from the principle of intelligibility and from the requirement that any instance of force have a ground in some substantial power. Leibniz takes the demand for intelligibility to rule against putative explanations of physical change that are not couched in terms of forces exercised through body-body contact. In his view, it is unintelligible how one extended body can affect another except through physical contact with it. To this extent, the program of mechanistic physics is upheld: “That physics which explains everything in the nature of body through number, measure, weight, or size, shape and motion, which teaches that nothing is moved naturally except through contact and motion, and so teaches that, in physics, everything happens mechanically, that is, intelligibly, this physics seems excessively clear and easy” (GP VII 337/AG 312). At the same time, mechanistic physics is judged to be incomplete as an account of the existence and mode of action of the forces exercised by bodies. These forces, and the laws governing them, cannot be explained in terms of size, shape and motion, but presuppose something additional in body, a substantial form, primitive force or entelechy, which is the ground of the forces exerted in motion and collision.

Unfortunately, to say all of this is merely to set the stage for the deepest problem that confronts the interpretation of Leibniz's position. Bodies (appear to) gain and lose derivative force through motion and through contact with other bodies. Those forces, however, claim a ground in reality as modifications of the active powers of souls or substantial forms. The unification of this set of doctrines poses an extraordinary challenge, to which Leibniz appears to respond in two distinct ways. Structurally, the two accounts are closely related, though most commentators have seen them as inconsistent from an ontological point of view.<sup>13</sup> The first account responds to the incompleteness of mechanistic physics by replacing it with a conception of matter as consisting of infinitely enveloped living bodies or corporeal substances. On this understanding of matter, the forces exerted by bodies are explained as modifications of primitive active forces, which themselves are identified with the forms of the constitutive corporeal substances.<sup>14</sup> A second approach goes beyond this, conceiving of the substances that are the ultimate constituents of matter as unextended, soul-like monads. Monads, like corporeal substances, are endowed with primitive active and primitive passive powers, i.e. substantial form and primary matter. Hence, we should expect Leibniz to pursue exactly the same pattern of explanation in this case: The derivative forces of moving bodies are accounted for as modifications of the primitive active powers of the substances constitutive of those bodies.

On the face of it, it might seem that the first account is more promising simply because it is more firmly rooted in *terra firma*: The substances that ground the existence of corporeal forces are themselves corporeal. However, there is reason to be cautious of this assumption. The two theories face a similar challenge of explaining how physical forces like *vis viva* arise as modifications of a soul-like substantial form.<sup>15</sup> Although this form is conceived as the soul of a unified (and physically extended?) body in one case and not in the other, this difference does not

make it any easier to understand how derivative physical forces arise as modifications of primitive active force. In fact, I suggest, what Leibniz intends to say on both accounts is very similar (and frustratingly incomplete): The laws that are observed to hold externally in the motions and collisions of bodies are grounded in the internal mode of action of “entelechies,” or substantial principles of force.<sup>16</sup>

Whatever problems remain with this account, it leads to the following conclusion: Leibniz’s investigation and interpretation of the laws of nature do not represent his most basic response to the topics of causation and natural change. That response comes in his claim that the explanation of physical change requires the supposition of a distinct property of force over and above corporeal mass and the passive powers of resistance and impenetrability, and that an adequate conception of this force requires that it be understood as the expression of an underlying “primitive active force” that defines the nature of substance. The interpretation of Leibniz’s position thus leads us from natural laws to substantial powers, the activity of which is the ground of the forces whose effects are represented by physical laws. On Leibniz’s account, the fact that *any* natural change occurs in the world is ultimately explained by the fact that substances act as an immediate consequence of their natures. Given this, our next task is to examine how Leibniz conceives of the intrinsic activity of substances.

### 3. Spontaneity and the Law of the Series

A defining thesis of Leibniz’s metaphysics is that every substance is the spontaneous source of all the changes that occur in its states. As he writes in the *Theodicy*:

[W]hen it is a question of explaining oneself precisely, I maintain that our spontaneity suffers no exception and that external things have no physical

influence on us, speaking with philosophical rigor. In order to better understand this point, we must realize that a genuine spontaneity is common to us and to all simple substances. (T 290-1; GP VI 289/H 304)

But to say that the soul does not produce its thoughts, its sensations, its feelings of pain and of pleasure, that is something for which I see no reason. In my system every simple substance (that is, every true substance) must be the true immediate cause of all its internal actions and passions; and, speaking with metaphysical rigor, it has none other than those which it produces. (T 400; GP VI 354/H 362)<sup>17</sup>

Leibniz's emphasis on what can be said with "metaphysical rigor" underlines the point that the spontaneity of substance is a foundational tenet for him. The sweeping nature of the spontaneity thesis is striking. In contrast to most philosophers, who limit spontaneity to a subset of substances (e.g. the rational ones) under specific circumstances, Leibniz maintains that all substances under all circumstances are the spontaneous sources of all their own modifications. Taking the category of substance to be limited (ultimately) to soul-like monads, this means that every monad is the source of all its active *and* passive states: its confused and unconscious perceptions and inclinations, as well as its conscious thoughts, reasonings and volitions.<sup>18</sup>

Leibniz offers both negative and positive arguments on behalf of the spontaneity thesis. Both rest on his underlying conception of substance. Negatively, he claims that it is impossible to explain how one substance can directly influence another, an effect that would require the migration of accidents from one to the other.<sup>19</sup> Positively, he argues that such an influence is unnecessary, since spontaneity follows directly from the notion of an individual substance, whose nature is "complete" or sufficient to determine all its own states.<sup>20</sup> However convincing one finds these arguments, it is obvious that in defending the spontaneity thesis Leibniz takes on



a significant explanatory burden. Supposing it is true that all the changes that occur in a substance are spontaneous changes, in that they occur independently of the influence of any other created substance, how does such change come about? What accounts for the fact that a substance is first in one state and then in another?<sup>21</sup>

The starting point for Leibniz's answer is that from creation any substance is endowed with an intrinsic power of acting. God has given a substance "from the beginning, a nature or an internal force that can produce in it, in an orderly way [...] everything that will happen to it [...] without the help of any created being" (GP IV 485/AG 144). In describing this power, Leibniz takes pains to distinguish his account from that of Aristotle and the scholastics, denying that his conception of substantial power or force involves any notion of potential, or an unactualized capacity for change:

Active force differs from the mere power familiar to the schools, for the active power or faculty of the scholastics is nothing but a proximate [*propinqua*] possibility of acting, which needs an external excitation or a stimulus, as it were, to be transferred into action. Active force, in contrast, contains a certain act or entelechy and is thus midway between the faculty of acting and the act itself and involves a conatus. It is thus carried into action by itself and needs no help but only the removal of an impediment. (GP IV 439/L 433)

Leibniz's elaboration of the claim that, to act, a substance needs "no help but only the removal of an impediment" relies on physical examples (e.g. a compressed spring), and so does little to aid our understanding of the dynamics of intrasubstantial change. One point he is intent on making is that, because there can be no external activation of a substance, a substance must be brought to action from within. Given this, it is a mistake to think of a substance as containing

merely the possibility or potentiality of acting; rather, a substance is already fully actual, or what Aristotle calls an *entelechy*:

One can call all simple substances or created monads *entelechie*s, for they have in themselves a certain perfection (*echousi to enteles*); they have a sufficiency (*autarkeia*) that makes them the sources of their internal actions, and, so to speak, incorporeal automata. (Mon 18; GP VI 609-10/AG 215)<sup>22</sup>

At one level, the picture Leibniz paints of substance is clear enough. Every substance is, by nature, a source of activity. Its activity is expressed in changing states (in the case of monads, perceptual states). So far, however, we have no way of conceptualizing the reason for a substance's transition from one state to another. Leibniz believes that this change is explained by the power intrinsic to the substance. The problem with this answer is that, as stated, it seems no less ad hoc than the appeal to "occult powers" that he criticizes. He rejects the idea that to explain phenomena of repulsion and attraction it suffices to posit a magnetic power. How are we any better off in positing a "substantial power," which expresses itself in a succession of distinct states of the substance? The concern is that there is nothing in the concept of an "active power," even one that is more *entelecheia* than *dunamis*, that would allow us to understand why that power should give rise to one succession of states rather than another. Arguably, we have here the same sort of violation of the principle of intelligibility that Leibniz elsewhere inveighs against.<sup>23</sup>

Leibniz is adamant that a solution to this problem cannot be given by direct appeal to God. Responding to occasionalist views of divine action in *De ipsa natura*, he stresses that in giving order to the universe, God must be understood as doing more than simply issuing an external command to creatures. Rather, there must follow an "enduring impression in the thing

itself,” in the form of “an inherent law [*legem insitam*] [...] from which both actions and passions follow” (GP IV 506-7/AG 158). Leibniz’s reasoning invokes the same considerations of intelligibility that we saw at work in his critique of other philosophers. If all natural change is ultimately explained by the activity of substance, and substances act spontaneously, then there must be something about the nature of substance that accounts for the particular series of states by which it is modified. As Leibniz sees it, this can only be a law that is inherent in the nature of substance itself:

[I]t is not sufficient to say that God, creating things from the beginning, willed that they follow a certain definite law in their change [*progressus*] if we imagine this will to have been so ineffective that things are not affected by it and no lasting effect was produced in them [...]. But if, indeed, the law God laid down left some trace of itself impressed on things, if by his command things were formed in such a way that they were rendered appropriate for fulfilling the will of the command, then already we must admit that a certain efficacy has been placed in things, a form or a force, something like what we usually call by the name ‘nature,’ something from which the series of phenomena follow in accordance with the prescript of the first command. (GP IV 507/AG 158-9)<sup>24</sup>

Again we find Leibniz insisting against occasionalists that the effects of a substance (its changing states) must be accounted for in terms of some fact about its nature. Anything less than this would render such change a perpetual miracle. However, the assumed spontaneity of substance places unique demands upon that nature. If a substance is the spontaneous source of all its own states, then there must be something about its nature which determines that just those states and no others follow from it. According to Leibniz, this implies that a substance’s nature

must incorporate a law, whereby “the series of phenomena follow in accordance with the prescript of the first command.” Thus, just as the demand for intelligibility leads Leibniz from laws to powers, in the case of substance it leads him from powers to laws—in this case “a law of the series” that pertains uniquely to the nature of each created substance.

The doctrine of the law of the series is an enduring part of Leibniz’s metaphysics that enters his writings during the late 1670s and finds an important place in letters composed for De Volder during the first decade of the eighteenth century.<sup>25</sup> There is no doubt that Leibniz invests the law of the series with a causal aspect. Insofar as this law is identified with the individual nature of a substance, and that nature involves an active power that is the spontaneous source of all of a substance’s states, the law of the series can be seen as “determining” the succession of those states. In the *Theodicy*, Leibniz reiterates his view that “by nature every simple substance has perceptions, and that its individuality consists in the perpetual law which brings about [*fait*] the series of perceptions that are assigned to it and that arise naturally one from another” (T 291; GP VI 289/H 304; trans. modified).

Still, though it is natural to invoke causal notions in describing the law of the series, it is far from obvious that this law can bear a primary role in explaining the changes that occur in a substance’s states. In fact, Leibniz more often appeals to the law of the series in connection with considerations of the individuality and identity of substance. In the former case, the “law of the series” stands in for the claim that the nature of any substance is “complete,” in the dual sense that it contains whatever will ever be true of that substance and that it is sufficient to distinguish that substance from every other actual or possible substance. Here what is important about the law of the series is that it involves, in some unspecified sense, a complete history of a substance’s states.<sup>26</sup> In other contexts, Leibniz appeals to the law of the series in establishing the

endurance, or temporal identity, of a substance; it is that which remains the same while the states of the substance change:

The succeeding substance will be considered the same as the preceding as long as the same law of the series or of simple continuous transition persists, which makes us believe in the same subject of change, or the monad. The fact that a certain law persists which involves all of the future states of that which we conceive to be the same—this is the very fact, I say, which constitutes the enduring substance. (GP II 264/L 535)<sup>27</sup>

While the law of the series has a variety of roles to play in Leibniz's metaphysics, the one thing it does not do is to explain, in a way that meets Leibniz's own strictures on explanation, why the states of a given substance develop in the way they do. One consideration supporting this is Leibniz's identification of the law of the series with a substance's entelechy or primitive active force.<sup>28</sup> The doctrine of spontaneity implies that a substance, by virtue of its primitive active force, is the source of all its own states, but it offers no way of predicting what those states will be. The law of the series is said to contain this information, but it provides (so far as we can understand it) no explanation of that order. It encapsulates a complete history of all that a substance will do, but it does not render intelligible, as an instance of natural change, the transition from one state of the substance to another.

Explanations that meet the condition imposed by Leibniz's principle of intelligibility must be ones that can be grasped by a finite mind: they must allow us to understand how a being of a given nature can be affected by specific modifications.<sup>29</sup> The law of the series fails to meet this condition, both because it does not render a substance's states intelligible as modifications of its primitive active force and because it cannot be grasped by a finite mind. Knowing a

substance's law of the series (which only God can know), one would know all the states of the substance, in the order in which they occur. What one wouldn't know, however, is why if a given substance is in state  $s_n$ , it will thereafter, as a matter of natural necessity, be in state  $s_{n+1}$ . Such an explanation requires a generality that is missing in the law of the series, each example of which pertains uniquely to a single substance. It must explain why if any substance is in a state  $s_n$ , characterized in suitable theoretical terms, it will thereafter, given the laws of nature, be determined to be in state  $s_{n+1}$ . Of course, one may object that substantial change is distinguished from other, less fundamental kinds of change precisely in that it is not subject to natural law in this way. But that, I believe, is not Leibniz's position. Substantial change—spontaneous change in a monad—is subject to natural law in the same way as change in the physical realm. The difficulty lies in ascertaining exactly which natural laws play a primary role in explaining the occurrence of substantial change.

#### 4. Laws of Substantial Change

In developing an account of change in the monad, we must first fix on the relevant causal relata. Leibniz is clear that in explaining changes in the states of a monad, the relevant causes are the states themselves, or forces associated with those states. More specifically, he holds that a monad's appetitions are the causes of changes in it and that the effects are new perceptions:

A monad, in itself and at a moment, can be distinguished from another only by its internal qualities and actions, which can be nothing but its *perceptions* (that is, the representation of the composite, or what is external, in the simple) and its *appetitions* (that is, its tendencies [*tendances*] to go from one perception to another) which are the principles of change. (PNG 2; GP VI 598/AG 207)<sup>30</sup>

Appetitions are the inherent “tendencies” of a monad’s states to change; and these Leibniz identifies with modifications of the monad’s entelechy or primitive active force.<sup>31</sup> The account he develops is thus of substances that “change themselves” by forces or tendencies proper to their perceptual states.

That substances are efficacious in this way is critical for Leibniz’s efforts to distinguish the causal contribution that God makes to a substance and actions that are attributable to the substance itself.<sup>32</sup> According to Leibniz, God is responsible for creating, and continually conserving, “that energy or activity [*cette energie ou activit *] [...] which makes up the nature of the substance and the source of its modifications,” but God does not “act alone in substance, or alone cause their changes” (GP IV 588-9). Changes in a substance’s states are to be ascribed, instead, to derivative forces associated with prior states of the substance. These forces are modifications of the primitive force, or nature, created and conserved by God; but changes in those modifications are not to be explained by appeal to divine action. To go down that road is to embrace occasionalism, and ultimately Spinozism.<sup>33</sup>

The account Leibniz gives is consistent with the strictures he places on causal explanation. Changes in the states of a monad are explained in terms of its own nature—however, crucially, it is that nature *as modified*. While all the states of a substance depend ontologically on the primitive active force produced by God, since they exist only as modifications of primitive force, changes in the substance are explained by appeal to prior states that determine the existence of new states.<sup>34</sup> We will see shortly that such an explanation also meets the condition of being intelligible to a finite mind.

Leibniz’s doctrine of monadic change is a species of a general theory of change that he develops in metaphysical studies from the 1680s. In the most abstract terms, Leibniz defines

change as “nothing but a complex of two states which are immediate and opposite to each other, together with a force or reason for the change [*vi seu transitus ratione*], which reason itself is a quality” (C 9/MP 134).<sup>35</sup> The definition involves several elements. First, change is not a state of a thing, but a complex, or aggregate, of a pair of contradictory states. Second, a condition that remains implicit in the definition, these states are ordered as prior and posterior, and there is a reason (or cause [*ratio*]) why the one succeeds the other.<sup>36</sup> Third, this reason is a force, which itself is a quality of the thing, and, more specifically, of the prior state.<sup>37</sup>

Leibniz’s description of monadic change conforms closely to this model. The state of the soul, he writes, “is a state of change, a tendency” (GP IV 562/L 579)—a state that will change given the force inherent in it. To De Volder, he characterizes the changes in a soul’s state in terms that echo his abstract definition: “in the simple substances themselves we know nothing besides perceptions or the reasons [*rationes*] for them [...] I consider it demonstrated [...] that it is essential to substance that its present state involves its future states and vice versa, and that the *force*, or reason for the transition to new perceptions [*Vis... aut ratio transitus ad novas perceptiones*], can be sought nowhere else” (GP II 282/L 529; trans. modified).

From these remarks, we can draw several conclusions about the account Leibniz develops of spontaneous change in the monad:

1. Monadic states themselves (or the appetitive forces associated with those states) are causally *efficacious* in the production of new states, which in turn are productive of new states, and so on.<sup>38</sup>
2. For the thesis of spontaneity to be upheld, the complete state of a monad at any moment must be *sufficient* by itself to determine a new state of it. Given the force inherent in that state, a new state will come about unless that force is somehow impeded. However,



nothing external can impede the inherent tendency to change of a monad's state. Hence, the state will change in a way that is determined by its total force.

3. In determining a new state, the prior state does not *necessitate* the existence of the new state. As Leibniz repeatedly emphasizes, a monad's appetitions "incline without necessitating." This means that the existence of the prior state does not by itself logically or metaphysically necessitate the existence of the state that follows from it. Rather, that state follows by a natural or physical necessity, in accordance with a law attributable to God's choice of the best.<sup>39</sup>

When Leibniz states that "every present state of a simple substance is naturally [*naturellement*] a consequence of its preceding state" (Mon 22; GP VI 610), we should understand him to mean that every state of a monad is determined by a preceding state, and that this determination occurs by virtue of the appetitive force of that state acting in accordance with a law governing the operation of such forces. I take the relevant notion of law to be distinct from the law of the series, because it is a law that applies, in common with laws of nature in general, to the operation of a certain *kind* of cause—in this case monadic appetite. The proposal, then, is that in monads as much as in bodies natural change is explained by citing (i) a complete description of the state of the monad (the content of its perceptions and the tendency of those perceptions to change) and (ii) a law representing a functional relation between that state and a new state that follows naturally from it. As with physical systems, so with monads, it may be impossible to write down a complete description of a given state. Yet that does not count against there being a law that represents the way in which a state with such-and-such properties naturally determines a state with certain functionally related properties. The law in question will be a

general law, grounded in the nature of the subject and graspable by a finite mind, and hence such an explanation will meet the demands Leibniz places on the intelligibility of nature.

##### 5. “Laws of Final Causes”

It is well known that Leibniz contrasts the laws that pertain to change in souls and the laws that pertain to change in bodies. Souls are said to act according to laws of final causes, whereas bodies according to laws of efficient causes:

Souls act according to the laws of final causes, through appetitions, ends and means. Bodies act according to the laws of efficient causes or of motions. And these two kingdoms, that of efficient causes and that of final causes, are in harmony with each other. (Mon 79; GP VI 620/AG 223)

The distinction Leibniz draws must be handled cautiously. In this passage he appears to use “laws of efficient causes” in a restricted sense that identifies them with the laws of motion, which apply exclusively to bodies.<sup>40</sup> As we have seen, however, his general account of intrasubstantial change represents the states of a monad as causally efficacious in the production of new states. Given this, there is no reason to infer that bodies alone act as efficient causes, whereas souls operate in a different manner that precludes their states being efficient causes of new states.

At the same time, there are two ways of interpreting Leibniz’s statement that souls act according to the “laws of final causes.”<sup>41</sup> On the one hand, we may take this to mean that states of the soul are teleologically directed in the strong sense that they involve desires, inclinations, or endeavors for what is perceptually represented by the soul *as good*. On this model of monadic activity, appetite in general is conceived on analogy with a soul’s conscious desires for

sensuous goods, i.e. bodily pleasure, or intellectual goods. Although most of the appetitions of most monads are unconscious strivings for unrecognized goods, on this reading of Leibniz's position the laws that explain changes in a monad's states construe the forces of its appetite as endeavors for what is represented as good. In general, such laws will take the form: If a monad has appetitions for such-and-such ends represented as goods, then it will act to realize those ends, to the greatest extent possible. Leibniz accepts that a single agent often has appetites for conflicting ends, good in themselves, and so some tradeoff among these ends will be necessary. In this case, the outcome of the monad's action is ascribed to the principle of the best: That result is realized which involves it achieving the greatest goodness possible in those circumstances.<sup>42</sup>

There is, though, a second way of thinking about how notions of final causation are implicated in Leibniz's theory of monadic change. We may assume that all appetite is teleological in the sense that it is a directed tendency toward the good. The most fundamental way in which this is true, however, is that God has ordered the created world so that it develops in a manner consistent with the principle of the best. Accordingly, *any* change in a monad's state is end-directed in that it is a movement toward the best next state of the universe, insofar as that monad participates in it. On this way of thinking of Leibniz's position, it is not necessary that the best next state of the universe be one that is represented *as good* by the monad. For Leibniz, notions of optimality and fitness apply as much to the order of the phenomenal physical world as to monads themselves. Moreover, he explicitly asserts that the perceptions of every monad involve a complete representation of the universe of phenomena, as perceived from the perspective of its body (Mon 60, 62). Thus, to the extent that the phenomenal physical world evidences teleology through the fitness of the laws that govern change within it, so must the perceptions that change as representations of a physical world. Such changes in a monad's

perceptual states are ascribed to the actions of the appetitions, or derivative forces, proper to its states. Yet, on this model, the primary significance of these forces is that they produce in the monad an updated representation of the physical universe. In short, all change in a monad is caused by appetite; all appetite is directed toward the good, in that it brings about a representation of the best next state of the universe; however, because of this, the *laws* that explain the transitions in a monad's states are the same laws that explain change in the world of physical phenomena. With respect to a monad's total perceptual state, the end-directedness of its appetitions is explained in terms of their production of new perceptions that represent the evolving state of the universe, as ordered by the laws of physics.

It is worth emphasizing that both models of final causation explain changes in the monad by reference to the *content* of its perceptual states. On the first model, the relevant content is a monad's representations of objects as good, which are subsumed under a law governing the optimal satisfaction of appetite or desire; on the second model, the relevant content is the monad's representations of a physical universe, which evolves according to laws that evidence fitness.

The issue that remains for us is how to frame the relationship between these two models of the teleological laws governing monadic change. One question is whether both models support fully general laws that can account for any instance of change in a monad. That is, given a monad in a suitably characterized state  $s_n$ , do the laws explain why that monad is thereafter determined by forces internal to it to be in state  $s_{n+1}$ ? I have argued elsewhere that the first model, which construes a monad's perceptions as representations of apparent goods, faces particular problems in explaining transitions in which a monad passes from states of pleasure to states of pain. In such cases, Leibniz's preferred explanation of the change is in terms of the

condition of the monad's body, which it represents as passively affected by external physical causes.<sup>43</sup>

Suppose, though, that the two models issue in equally general laws. Is there reason to see one of these sets of laws as primary from an explanatory point of view? Two arguments favor "laws of appetite" as fundamental in the explanation of monadic change. First, they seem the right *kind* of laws to appeal to in explaining changes in a soul-like substance, whereas physical laws, whatever fitness they evidence, are the wrong kind of law. This is reinforced by the fact that Leibniz explicitly distinguishes "laws of final causes" that operate in the soul from one important type of physical law, namely, laws of motion. Second, it might be thought that physical laws cannot contribute to a fundamental explanation of monadic change, because they themselves are not fundamental. As we have seen, Leibniz stresses the need for a grounding of physical laws, especially the law of the conservation of force, in the primitive active force of substance. Given this, it may seem circular to attempt to explain the operation of this force in terms of the very laws it is supposed to ground.

Both of these objections raise important considerations, but neither, I believe, is decisive when considered in the context of Leibniz's theory of monads. It is a foundational commitment of that theory that *forces* internal to a substance are determinative of changes in its states. The laws that explain such changes are a separate issue. In a trivial sense, they are "laws of appetite," i.e. laws governing appetite, but their form will depend upon how we characterize appetite (also called by Leibniz "tendency" and "endeavor") as *force*. One possibility is that the most general representation of this force is as a desire-like tendency for what is represented as good. Another possibility is that this force is only manifested as appetite or desire in some of the inclinations of sensitive souls, and that a deeper account renders it appetitive in name only, much

as Hobbes preserves the term *conatus* (or “endeavor”) while stripping it of any teleological meaning.

If appetitive force is simply a directed tendency toward some future state, then there is no obvious requirement that this state be characterized by Leibniz in terms of an apparent good. Instead, the directedness of the tendency can be explicated in terms of the represented state of the universe itself: It is the next best state for the universe to be in, even if it is not represented as such by any finite monad. If this is correct, then the laws that explain the evolution of a monad’s perceptions could be the physical laws of nature. Note, however, that these laws would be given a different import than they were originally thought to have. Originally, they were seen not as fundamental, but as requiring a ground in the activity of substance. Now, on the theory of monads, they are given such a ground by being natural laws governing the progression of monadic perceptual states. The features Leibniz found to be missing in the laws conceived as mere physical laws are supplied by the fact that they express the natural operation of monadic appetitive force. On this reading, there is no vicious circularity in Leibniz’s reasoning: the laws that were judged to require a ground in substance are given such a ground and at the same time acquire a new identity as laws of monadic progression.

A full exploration of this topic would require more space than is available here. In lieu of that, I will close by highlighting some of the evidence on behalf of the account I have just sketched. Exemplary of this tendency in Leibniz’s thought is the following statement from his unpublished remarks on Note L of the article “Rorarius” in the second (1702) edition of Bayle’s *Dictionary*:

It is better to say that God put into each soul ‘the world in concentrated form,’ or gave it the power to represent the universe according to the point of view

appropriate to that soul. It is this which is the source (*principe*) of its actions, and which distinguishes them one from another and from the actions of another soul. For it follows that they will continually undergo changes which represent the universe's changes, and that other souls will have other, but corresponding, changes. (GP IV 542/WF 100)

When Leibniz speaks of the “world” or the “universe,” he means the physical universe of bodies, related in space and time, which he acknowledges by this time to be merely phenomenal. Nevertheless, he draws on this phenomenal content in accounting for the transitions that occur in the soul's perceptual states. The “principle” of the soul's actions is that by nature it immediately represents the physical state of a body, which defines its point of view on the universe.<sup>44</sup> Because this body is (represented as being) spatiotemporally and causally related to all other bodies, in representing its body, the soul indirectly represents the “whole universe”—a state of affairs that is replicated as many times as there are souls or monads, each identified with a unique bodily point of view.

On this account, although the physical universe is not ontologically fundamental for Leibniz, a *representation* of the physical universe is fundamental in defining the content of monadic perceptions and the way in which those perceptions change in a lawful manner. The “universe” that is the object of every monad's perceptions is a closed system of bodies that evolves according to physical laws; and, according to Leibniz, any changes in the state of monad's body can be fully explained by the laws of physics. Consequently, if it is the nature of the soul to represent its body, and changes in the state of this body are explained by its lawfully determined relations to all other bodies in the universe, then the perceptions of the monad must evolve in exactly the same way. Changes in its states are explained by appeal to changes in the

*contents* of its states, which is to say, in terms of the laws of physics themselves. Leibniz makes this point forcefully in his published response to the second edition of Bayle's *Dictionary*: "the reason for a change in the soul's thoughts is the same as for the change in things in the *universe* which it represents. For mechanical causes, which work themselves out in the body, are brought together, and, so to speak, concentrated in souls or *entelechie*s, and indeed originate there" (GP IV 562/WF 116).<sup>45</sup>

I conclude that it is Leibniz's view that every change in a monad can be explained by appeal to the way in which the content of its perceptual states evolves in accordance with the laws of physics. As he writes in a 1702 letter to Bayle,

I do not know how to explain the constitution of the soul any better than by saying (1) that it is a simple substance, or what I call a true unity; (2) that this unity nevertheless expresses a multitude, that is, bodies, and that it does so as well as is possible according to its point of view, or its relations; (3) and that therefore it expresses phenomena according to the metaphysico-mathematical laws of nature, that is, according to the order most befitting to intelligence or reason. (GP III 72/WF 132)<sup>46</sup>

Nowhere in this seemingly categorical statement of Leibniz's position do we find changes in the soul's perceptual states explained by its desires or appetites (conscious or unconscious) for the good. The end-directed character of these changes is limited to their being explicable in terms of "metaphysico-mathematical laws of nature" that express "the order most befitting to intelligence or reason." This does not mean, of course, that Leibniz does not also evoke teleological considerations more explicitly in describing the "tendencies" that are a soul's appetitions. Some of these at least (e.g. conscious desires and volitions) must be thought of as



strivings for objects represented as good. Whether all of the changes in a monad's perceptual states can be explicated in this way, in a manner parallel to their explanation in terms of the evolving state of the represented physical universe, or whether only some changes can be understood in this way, remains an open question.<sup>47</sup>

## 6. Conclusion

We started with the idea that the laws of nature are contingent decrees, chosen by God as the optimal order for the physical world. Leibniz insists, however, that to the extent that these laws define the order of nature, they require a ground in the *natures* of created beings, and this ground cannot be had if the nature of body is such as mechanists conceive it. For the grounding claim to be supported, a body must be constituted by principles of active force or power, which Leibniz identifies with the form of a substance. This prompted the question of how we are to conceive of activity and change within a substance: How do there arise the determinations of primitive active force in terms of which Leibniz explains the derivative forces found in bodies?

In his late writings, Leibniz represents primitive active force as a principle of spontaneous change within an unextended, soul-like monad, and he attributes such changes within monads to the exercise of a power of appetition. I have argued that the exercise of this power involves the causal determination of subsequent states of a monad by the force inherent in its prior states. Such determination, for Leibniz, is an instance of natural or physical necessity that proceeds in accordance with teleological laws of nature. I have sketched two models of how such law-governed activity might be understood and have offered textual evidence on behalf of an account according to which changes in the content of a monad's perceptual states are explained by appeal to physical laws of nature that evidence signs of fitness, or God's choice of

the best. Remarkably, then, in delving more deeply into the details of Leibniz's metaphysics, we have come full circle. In attempting to identify the laws that explain the spontaneous changes in a monad's states, we are led back to the very physical laws that initiated the original demand for explanation. In a nutshell, then, the story is this: On Leibniz's account, in the attempt to understand the order of nature, we are led from laws to powers and from powers back to laws. Neither laws nor powers have explanatory priority; both are required for an adequate conception of the order God has given to nature.<sup>48</sup>

<sup>1</sup> For recent discussions of Leibniz's treatment of the laws of nature, see Daniel Garber, *Leibniz: Body, Substance, Monad* (Oxford: Oxford University Press, 2009); Jeffrey K. McDonough, "Leibniz on Natural Teleology and the Laws of Optics," *Philosophy and Phenomenological Research* 78 (2009): 505-43, and "Leibniz's Optics and Contingency in Nature," *Perspectives on Science* 18 (2010): 432-55.

<sup>2</sup> See also *Principles of Nature and of Grace* (hereafter: PNG), §11: "God's supreme wisdom has led him, above all, to choose *laws of motion* that are best adjusted and most suitable [*les plus convenable*] with respect to abstract or metaphysical reasons [...]. And it is surprising that, by a consideration of *efficient causes* alone, or by a consideration of matter, we cannot give the reason for the laws of motion discovered in our time, some of which I myself have discovered. For I have found that we must have recourse to *final causes* for this, and that these laws do not depend upon *the principle of necessity*, as do logical, arithmetical, and geometrical truths, but upon *the principle of fitness* [*du principe de la convenance*], that is, upon the choice of wisdom. And this is one of the most effective and most evident proofs of the existence of God for those who can delve deeply into these matters" (GP VI 603/AG 210-11).

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<sup>3</sup> See McDonough, “Leibniz on Natural Teleology and the Laws of Optics.”

<sup>4</sup> For a defense of this reading, see Donald Rutherford, *Leibniz and the Rational Order of Nature* (Cambridge: Cambridge University Press, 1995), 26-35.

<sup>5</sup> On Malebranche’s conception of the laws of nature, see Steven Nadler, “Malebranche on Causation,” in *The Cambridge Companion to Malebranche*, ed. Steven Nadler (Cambridge: Cambridge University Press, 2000), 112-38; Walter Ott, *Causation and Laws in Early Modern Philosophy* (Oxford: Oxford University Press, 2009).

<sup>6</sup> “I believe that there is no natural truth in things whose explanation [*ratio*] ought to be sought directly from divine action or will, but that God has always endowed things themselves with something from which all their predicates are to be explained” (*Specimen dynamicum*, Part I; GM VI 242/AG 125). See also T 207 (GP VI 240-1/H 257) and T 355 (GP VI 326/H 338-9); his comments on Lamy (GP IV 587-8, 594-5); and his letters to Basnage de Beauval, ca. 1696 (GP III 122) and Conti, 9 April 1716 (GB 277).

<sup>7</sup> A full account of the grounds of Leibniz’s disagreement with Malebranche over natural causation would have to include discussion of Leibniz’s notion of substance as by nature involving a principle of action (leading to the charge that occasionalism is tantamount to Spinozism), and the two philosophers’ respective understandings of the wisdom God expresses in creation. I take up these issues in Donald Rutherford, “Natures, Laws, and Miracles: The Roots of Leibniz’s Critique of Occasionalism,” in *Causation in Early Modern Philosophy*, ed. Steven Nadler (University Park, PA: The Pennsylvania State University Press, 1993), 135-158. For a critique of one of the claims made there, see Nicholas Jolley, “Leibniz and Occasionalism,” in *Leibniz: Nature and Freedom*, ed. Donald Rutherford and J. A. Cover. (New York: Oxford

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University Press, 2005), 121-34, who frames the disagreement in terms of the primacy given to laws (Malebranche) versus causes (Leibniz) in scientific explanation.

<sup>8</sup> For a development of this point, see Rutherford, *Leibniz and the Rational Order of Nature*, chs. 2-3.

<sup>9</sup> I expand on these criticisms in Donald Rutherford, "Leibniz's Principle of Intelligibility," *History of Philosophy Quarterly* 9 (1992): 35-49.

<sup>10</sup> For extended discussions of both points, see Garber, *Leibniz: Body, Substance, Monad*, chs. 2-4.

<sup>11</sup> "Substances (material or immaterial) cannot be conceived in their bare essence, devoid of activity," Leibniz writes in the *New Essays*. "Activity is of the essence of substance in general" (RB 65).

<sup>12</sup> The claim that besides passive matter there must be in bodies a substantial principle of force also supports the thesis that the laws of motion exhibit marks of fitness. Leibniz's rationale appears to be this: If the laws of motion followed directly from the concept of matter, then they would hold of necessity and there would be no sense of their being "fitting"; however, if the laws are consequent on an underlying principle of force, then they inherit their fitness from the (teleological) mode of action of that substance. See his letter to Fontanelle of 7 April 1703: "Thus the laws of motion are no more geometrically necessary than is architecture. And nevertheless there are between them and the nature of body relations that indeed do not escape us completely. These relations are founded principally in the entelechy or principle of force which joined to matter results in the corporeal substance. It can even be said that these laws are naturally essential to this entelechy or primitive force that God has put into bodies, and consequently to the corporeal substance; for if they did not originate from that they would not be

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natural at all, but miraculous, and God would be obliged to achieve observance of them by a continual miracle. But they are not at all essential to matter, that is to say to what is passive in corporeal substance” (FC 226-7/S 136-7; trans. modified).

<sup>13</sup> It is beyond the scope of this essay to assess whether these accounts are in fact incompatible with each other, or whether Leibniz discovers a way of reconciling them. For different answers to this question, see Robert Merrihew Adams, *Leibniz. Determinist, Theist, Idealist* (New York: Oxford University Press, 1994); Rutherford, *Leibniz and the Rational Order of Nature*; Garber, *Leibniz: Body, Substance, Monad*.

<sup>14</sup> See, e.g., the letter to Fontanelle cited in note 12.

<sup>15</sup> The corporeal substance theory is sometimes thought to have an advantage as a foundation for physics, because the passive forces of matter (resistance, impenetrability) are explained in terms of a passive principle (primary matter) distinct from soul or form, whereas on the theory of monads the ground of passive force is an aspect of the monad, identified with its confused perceptions. But this difference, if it can be sustained, does not obviate the point that on both accounts Leibniz explains derivative active force (e.g. *vis viva*) as a modification of a soul-like form or entelechy.

<sup>16</sup> Leibniz may not recognize it as a deficiency of his account that it says no more than this; recall his insistence that forms or entelechies are not to be appealed to in the explanation of particular phenomena. It is enough that they exist as ontological grounds for the existence of derivative forces. How the latter arise from the former, and whether, e.g., instances of derivative force can be identified with modifications of primitive active force, may simply lie beyond our ken. Independently of this, there is reason to think that Leibniz’s acceptance of the theory of monads, as the sole substantial principles of force, may push his account away from a realist construal of

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physical force. His late writings leave it uncertain whether instances of physical force are to be interpreted as formal modifications (or aggregates of modifications) of the primitive forces of monads, or whether they are best understood, along with extension and its modifications, as aspects of the *content* of monadic perceptions. For discussion of this issue, see Adams, *Leibniz. Determinist, Theist, Idealist*, 378ff.

<sup>17</sup> In both passages I have modified Huggard's translation. See also "New System" (GP IV 485/AG 144); *Theodicy* §§64-5, 400; *New Essays*, II.xxi.72/RB 210; GP III 403/AG 195; GP IV 588; GP VII 312/MP 79.

<sup>18</sup> On the sense in which a monad is subject to actions and passions, see RB 210. In "Leibniz on Spontaneity," in *Leibniz: Nature and Freedom*, eds. Donald Rutherford and J. A. Cover (New York: Oxford University Press, 2005, 156-80), I argue for a systematic distinction between the concept of "monadic spontaneity" and that of "agent spontaneity," which Leibniz limits to voluntary agents and makes a necessary condition of freedom of the will.

<sup>19</sup> *Monadology* (hereafter: Mon), §7 (GP VI 607-8/AG 213-4).

<sup>20</sup> DM 14 (A VI.4, 1551/AG 47); "New System" (GP IV 484/AG 143).

<sup>21</sup> I assume that change for Leibniz is real and not merely apparent. See Mon 10-11: "I also take it for granted that every created being, and consequently the created monad as well, is subject to change, and even that this change is continual in each thing. It follows from what we have just said that the monad's natural changes come from an *internal principle*, since no external cause can influence it internally" (GP VI 608/AG 214). See also GP II 263-4/L 534-5; GP II 275/AG 181; GP IV 485/AG 144; T 396 (G VI 352/H 360-1); PNG 2 (GP VI 598/AG 207). For an argument challenging this assumption, see John Whipple, "The Structure of Leibnizian Simple Substances." *British Journal of the History of Philosophy* 18 (2010): 379-410.

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<sup>22</sup> See also the “New System”: “Aristotle calls [these forms] *first entelechies*; I call them, perhaps more intelligibly, *primitive forces*, which contain not only *act* or the completion of possibility, but also an original *activity*” (GP IV 479/AG 139).

<sup>23</sup> In unpublished comments on the second edition of Bayle’s *Dictionary*, Leibniz writes: “Saying that the soul’s God-given force is the only source [*principe*] of its particular actions is not sufficient to give the explanation for those actions” (GP IV 542/WF 100).

<sup>24</sup> See also his comments on Bayle at GP IV 548/WF 104.

<sup>25</sup> For an early appearance, see A VI.3, 326, and his final letter to Arnauld of 1690 (A II.2, 312). For occurrences in the De Volder letters, see GP II 171/L 517; GP II 258/L 533; GP II 262/L 533; GP II 263/L 534; GP II 264/L 535; GP II 275/AG 181. For further discussion and citations, see Rutherford, *Leibniz and the Rational Order of Nature*, 151-4.

<sup>26</sup> One difference between the “law of the series” and the earlier theoretical notion of a “complete concept” is that the former is intended to explicitly represent the development of a substance’s states. To De Volder, Leibniz writes: “I do not say that a series is a [temporal] succession but that a [temporal] succession is a series, which in common with other series has the property that the law of the series shows where it must arrive in continuing its progress or in other words, the order in which its terms will proceed when its beginning and the law of the progression are given, whether that order is a priority of essences only or also one of time” (GP II 263/L 534; trans. modified). The idea of the “law of the series” was evidently inspired by Leibniz’s work on mathematical series, where an infinite progression of numbers can be expressed by a finite formula. However, he offers no proof that the idea can be developed in an analogous fashion in metaphysics.

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<sup>27</sup> See also GP II 262/L 533; GP II 263/L 534. For an argument that the doctrine of spontaneity itself, and not just the idea of a law of the series, is implicated in Leibniz's explanation of the temporal identity of substance, see R.C. Sleigh Jr., *Leibniz & Arnauld: A Commentary on Their Correspondence* (New Haven: Yale University Press, 1990), 129-32.

<sup>28</sup> "But that which persists, insofar as it involves all cases, contains primitive force, so that primitive force is, as it were, the law of the series" (GP II 262/L 533). See also A VI.3, 326; GP II 264/L 535.

<sup>29</sup> See above, section 2, especially the passage from the Preface to the *New Essays* (RB 65-6).

<sup>30</sup> See also Mon 15, and his letter to Christian Wolff, after 5 May 1705: "In the soul there are two things: a state and the tendency to another state" (GLW 56).

<sup>31</sup> "Derivative force is itself the present state when it tends toward or preinvolves a following state, as every present is pregnant with the future" (G II 262/L 533). "I maintain that all souls, entelechies or primitive forces, substantial forms, simple substances, or monads, whatever name one may apply to them, can neither spring up naturally nor perish. And the qualities or derivative forces, or what are called accidental forms, I take to be modifications of the primitive entelechy" (T 396; GP VI 352/H 360-1). See also GP II 270/L 537; RB 216.

<sup>32</sup> This is necessary for rebutting the idea that God is the "author of sin." Finite substances must possess genuine agency if they are to be deemed responsible for sinful acts.

<sup>33</sup> See, e.g., T 392-395; GP IV 567-8/WF 122.

<sup>34</sup> See his Fifth Letter to Clarke, §91: "the nature of every simple substance, soul, or true monad [is] such that its following state is a consequence of the preceding one" (GP VII 412/L 711-2); and Mon 22: "since every present state of a simple substance is a natural consequence of its preceding state, the present is pregnant with the future" (GP VI 610/AG 216).



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<sup>35</sup> The term Leibniz uses for “change” is *transitus*, but similar definitions are given for *mutatio*. See A VI.4, 307, 556, 569, 869, 1411.

<sup>36</sup> “Of two contradictory states of the same thing, that one is *prior in time*, which is prior by nature, or which involves the ground [*rationem*] of the other” (A VI.4, 563).

<sup>37</sup> Leibniz characterizes the *ratio* of change both as force (*vis*) and as the active state from which change follows: “Action [*Actio*] is any state that is the proximate cause of change [...] Force or power is a state from which an action would follow unless there were something else that ought to follow from it with the same reason” (A VI.4, 1411). See also A VI.4, 940, and A VI.4, 1468: “Force itself, or power, or a state that demands [*exigit*] change.”

<sup>38</sup> For a defense of this claim, though one developed in a different way than I do here, see Lawrence Carlin, “Leibniz on Final Causes,” *Journal of the History of Philosophy* 44 (2006): 217-33.

<sup>39</sup> See *New Essays*, II.xxi.13: “we must distinguish what is necessary from what is contingent though determined. Not only are contingent truths not necessary, but the links between them are not always absolutely necessary either; for it must be admitted that when one thing follows from another in the contingent realm, the kind of determining that is involved is not the same as when one thing follows from another in the realm of the necessary. Geometrical and metaphysical ‘followings’ necessitate, but physical and moral ones incline without necessitating” (RB 178-9). Leibniz frequently offers the formula “incline without necessitating” as part of his defense of the will’s freedom (RB 175); however, this is only an instance of a general thesis about the determination of the soul’s states—and indeed any type of causal determination. See his Fifth Letter to Clarke, §§3-5; T 44ff.

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<sup>40</sup> Cf. PNG 3: “changes in bodies and external phenomena arise from one another by the laws of *efficient causes*, that is, the laws governing motions” (GP VI 599/AG 207-8).

<sup>41</sup> In Rutherford, “Leibniz on Spontaneity,” I distinguish these as the “law of desire teleology” and the “law of natural teleology.”

<sup>42</sup> For a nuanced development of this reading, see Bolton’s contribution to this volume (chapter 8).

<sup>43</sup> Rutherford, “Leibniz on Spontaneity.” Against this, it must be noted that there are a number of texts in which Leibniz appears to affirm that “laws of appetite,” in the sense explicated by the first model, apply universally in monads, including in so-called brute monads whose perceptions remain entirely unconscious. See PNG 3; GP III 341, 346-7, 508.

<sup>44</sup> Later in the same comments on Bayle, Leibniz writes: “My notion of the soul is the same: I think of it as an immaterial automaton whose internal constitution contains in concentrated form, or represents, a material automaton, and produces in the soul representations of its actions” (GP IV 548/WF 104).

<sup>45</sup> See also his unpublished comments on “Rorarius,” Note H in the 1702 edition: “The representation of the present state of the universe in the dog’s soul produces in it the representation of the subsequent state of the same universe, just as in the things represented the preceding state actually produces the subsequent state of the world. *In a soul, the representations of causes are the cases of the representations of effects*” (GP IV 533/WF 78; emphasis in the original).

<sup>46</sup> The third point is echoed in a contemporary letter to De Volder: “And finally you ask, ‘why are these appearances produced in me or in other true substances?’ I say: those that follow are

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produced from the preceding appearances in accordance with metaphysical and mathematical laws of eternal truth” ( GP II 275/AG 181). Cf. GP II 278/AG 184.

<sup>47</sup> Again, see Bolton (chapter 8 of this volume) for a defense of the former answer. In support of the latter, see the following passage from Leibniz’s unpublished “Remarks on Lamy” (November 1702): “But without laying any stress on the fact that the laws of motion are established in accordance with the divine wisdom, and are not geometrically necessary, it is sufficient to say that the perceptions which express the laws of motion are linked together just like those laws, which they express according to the order of efficient causes. *But the order of voluntary perceptions, which is that of final causes, is in conformity with the nature of the will*” (GP IV 580/WF 155; emphasis added).

<sup>48</sup> My thanks to Martha Bolton and Eric Watkins for helpful discussion of some of the issues discussed in this paper.