Leibniz and the Metaphysics of Powers

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Abstract

The notion of *force* is at the heart of Leibniz's metaphysics. One of his central theses is that powers are to be reconceived as forces. Connectedly, he maintains that force is essential to the very account of substance. The paper contends that these claims have not been well-understood due to an inadequate understanding of the notion of force itself. Against a common reading, I argue that Leibnizian force is not fundamentally dispositional, but an *activity*. Taking seriously this idea means reconsidering not only the nature and function of powers, but also the basic character of Leibniz's metaphysics—including his view of substances as soul-like and as causally independent. This paves the way for a novel interpretation of the unity of physical and metaphysical forces.

1. Introduction

Many early modern philosophers were notoriously hostile to Aristotelian metaphysics and especially the notion of power. Leibniz is an important exception, arguing that powers, along with substantial forms, are critical also to the new scientific world-picture.

His position has received increased attention as part of a renewed interest in the philosophical history of powers. This interest is largely motivated and shaped by the reemergence of powers within contemporary metaphysics.[1] In line with current discussions, scholars often assume that by 'power' past thinkers mean a dispositional property—a property whose essence consists in a directedness towards some manifestation.[2] The central issue then becomes whether powers or dispositional properties (dispositions, for short) belong to the ultimate level of ontology or whether that level is purely non-dispositional (categorical).

Such a *dispositionalist approach* (as I will call it) to earlier views of powers may seem attractive, offering a way of making history of philosophy relevant to present-day debates. Yet I will argue that in Leibniz's case the approach leads astray and actually obscures the philosophical significance of his concern with powers. Part of the reason is that the approach also obscures a central dimension of the Aristotelian notion of power.

Leibniz's defense of Aristotelian doctrines comes with a crucial qualification: in order to become "intelligible," powers and even substantial forms need to be radically reconceived as *forces*. As some commentators have already noticed, mostly in passing, Leibniz's notion of force

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[1] See e.g. the editors' introductions to two recent volumes on the history of powers: Jorati, "Introduction"; Hill, Lagerlund, and Psillos, "Introduction."

[2] For contemporary articulations of powers along such lines, see e.g. Ellis, *Scientific Essentialism*, 106–41; Molnar, *Powers*, 28–43; Vetter, *Potentiality*, 1–30.

does not neatly fit into the dispositionalist framework.[3] Indeed, I propose that Leibnizian force is, in an important sense, essentially manifest. Force, Leibniz claims, is an *activity*, which, as we will see, is his rendering of Aristotle's *energeia*—a *praxis* or operation. That is, rather than a disposition directed to some manifestation, force is an actual "doing."

This proposal may sound baffling, given the prevalent view of powers as dispositions. Making sense of it not only requires charting the complexity of Leibniz's engagement with Aristotelianism, but also attending to a major, although frequently ignored, difference between contemporary and traditional conceptions of powers. The primary focus of the Aristotelian appeal to powers is the constitutive question of *what* processes are, rather than the dispositional question of *why* change happens. The former question, I suggest, is also Leibniz's main concern as he turns to the notion of activity to account for powers. His point is that even though Aristotelians recognize the category of activity, they fail to see its metaphysical importance. For Leibniz, activity offers a way to meet the challenge the mechanistic world-view poses to the very intelligibility of powers.

Restoring force or activity to its due place in Leibniz's thought has wide ramifications. Many readers have detected a profound tension between his theorizing about powers or forces in the corporeal world and what are usually held to be some of the main tenets of his mature philosophy. The first is his alleged commitment to a view of fundamental reality as constituted by something like Cartesian minds: famously, Leibniz characterizes substances—*monads* in his later writings—as simple soul-like perceivers and strivers, as belonging to a "realm" distinct from that of bodies (*M* §§14–15, §79). Another reason for the tension lies in the causal independence of Leibnizian substances. According to his *spontaneity thesis* (as it is commonly termed), a substance is not only spontaneous in the traditional sense of being an originator of change, but in the special

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[3] Bolton, "Substance," 118–19; Jorgensen, *Mind*, 210. Cf. de Gaudemar, *Leibniz*, 25, 93.

sense of being the *sole* source (aside from God's concurrence) of *all* its states (*A New System of Nature and Communication of Substances* [*Systeme nouveau de la nature et de la communication des substances*], 1695, GP IV.484/AG 143–44).[4]

Attempts to address the tension often focus on the ontological status of bodies and, connectedly, questions about composition. Although important, these issues have overshadowed a deeper point. Seeing activity, rather than mind, as the basic notion for Leibniz, will lead us to reconsider not only the meaning of soul-likeness and the place of the spontaneity thesis in his metaphysics, but also the nature of the distinction between the metaphysical and corporeal realms. As I will show, the conception of power as activity allows for a sense in which physics is directly concerned with metaphysical forces.

First, however, we need a better sense of Leibniz's general concern with powers, as well as of the rationale for the dispositionalist approach. This is the aim of section 2. Section 3 argues that, despite its undeniable appeal, the approach fails to explain Leibniz's criticism of Aristotelian powers and his alternative view of power as force or activity. To explicate and motivate that view, section 4 outlines the constitutive role of Aristotelian powers and the plenum mechanistic challenge to it. Section 5 argues that Leibniz's conception of power as activity is a response to that challenge. I proceed to spell out the implications for his theory of substance. While drawing on the traditional connection between life and activity (section 6), Leibniz offers a novel account of the nature and status of life activity as constituting the very essence of substance (section 7).

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[4] Gerhardt's *Die Philosophischen Schriften* (GP) is cited by volume and page.

2. Power and Dispositionality

According to mechanistic science, the behavior of bodies can be fully explained in terms of arrangements of parts characterized by a small set of categorical features in conjunction with an equally small set of laws. This led notably Hobbes and Descartes to advocate a new austere ontology of the corporeal world: the nature of body can basically be captured in geometrical terms, including motion, understood as translation (mere change of place).[5]

From the mid-1670s onwards Leibniz emerges as a staunch critic of the Hobbesian-Cartesian program. Some of his central arguments focus on problems with taking the geometrical ontology as the basis for physics. In particular, he demonstrates that Descartes's physics yields incorrect laws of motion and conservation principles.[6] According to Leibniz, the implications are far-reaching: what this shows is that mechanistic physics requires powers (Latin: *potentia* or *virtus*; French: *puissance*) or forces (Latin: *vis*; French: *force*), terms he often employs interchangeably. The basic quantity conserved is the quantity of *force*—measured as the product of a body's mass (roughly, size) and speed squared (mv^2)—and not, as Descartes supposed, the quantity of *motion* (mv). Cartesian physics is to be replaced by a *dynamics*.[7]

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[5] This is at least how Leibniz understood Hobbes and Descartes. Descartes's actual position may be more complex: see Gabbey "Force and Inertia," 234–39; Hoffman "Passion and Motion," 125–37.

[6] See e.g. *Principia mechanica* (1678–80/81?), A VI.iv.1976–80/AG 245–50; *Brevis demonstratio* (1686), GM VI.117–23/L 296–301. I cite the academy edition (A) according to series, volume, and page, and Gerhardt's *Mathematische Schriften* (GM) according to volume and page.

[7] See the unpublished *Dynamica* (1691?), GM VI.281–514; *Specimen dynamicum* (1695), GM VI.234–54/AG 118–38. For a classic study see Gueroult, *Leibniz*. More recent treatments include Duchesneau, *La dynamique de Leibniz*; Fichant, "La dynamique"; Garber, *Leibniz*, 99–179; Tho, *Vis*; Arthur, *Monads*, 205–29.

At the same time, Leibniz stresses the *metaphysical* character of force. To explain the laws of nature, we need "the notion of *force*, which is very intelligible, despite the fact that it belongs to the domain of metaphysics [*la notion de la* force*, qui est tres intelligible, quoyqu'elle soit du ressort de la Metaphysique*]" (*New System*, GP IV.478/AG 139).[8] That is, in restoring powers or forces, and even substantial forms, Leibniz is not suggesting a return to Aristotelian physics. He does not seek to replace mechanistic explanations with explanations in terms of faculties and forms. Instead, force provides a *foundation* for the new physics.

Yet force is not only needed to get the physics right, but is also vital to accounting for the very nature of substance, as Leibniz explains in his programmatic 1694 article *On the Emendation of First Philosophy* (*De primae philosophiae Emendatione*): "The notion of *forces* or powers, which the Germans call *Kraft* and the French *la force*, and for whose explanation I have set up a distinct science of *dynamics*, brings the strongest light to bear upon our understanding of the true *notion of substance*" (GP IV.469/L 433).[9]

Leibniz's project gives rise to two distinct sets of questions. The first concerns the way the arguments within physics—over the formulation of the laws of motion and conservation principles—support the need to restore powers or forces. The second set concerns the nature of force itself and its metaphysical role: what more exactly is force and in what way is it essential to substance? Here I will mainly concentrate on the latter, arguably more fundamental, questions.

The dispositionalist approach takes these questions to turn on the basis for dispositionality—for why things are liable to behave, change and produce change, in characteristic

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[8] Occasionally, I have altered cited translations. If no translation is cited, then the translation is my own.

[9] "Notionem *virium* seu virtutis (quam Germani vocant *Krafft*, Galli *la force*) cui ego explicandae peculiarem *Dynamices* scientiam destinavi, plurimum lucis afferre ad veram *notionem substantiae* intelligendam."

ways. The problems within physics are to be seen as indicating a more general problem concerning the status of the laws of motion within the Hobbesian-Cartesian ontology of the corporeal world.

For Aristotelians, to be a substance is to have a set of basic powers, conceived as potencies directed towards some further actuality (as a sapling's augmentative power is directed towards being a fully-grown tree). These powers are grounded in, emanate from, a substance's form or nature.[10] The latter is a "principle of operation" in constitutively involving a directedness towards *propria*, a substance's necessary accidents, including its basic powers. The dispositionalist approach construes these ideas as readily expressible in the contemporary idiom of dispositional properties intrinsically directed towards manifestations. Thus understood, the Aristotelian view purports to explain dispositionality in terms of a theory of fundamental reality as dispositional.

From this perspective, simply getting rid of powers in favor of general laws of motion is a non-starter. While the particular kind of explanations in terms of powers Aristotelians (supposedly) offer—say, a sapling grows because it has an augmentative power—are clearly inadequate from a mechanistic point-of-view, we still need an account of *why* bodies follow the laws of motion. One answer is the occasionalist conception of laws of nature as directly upheld by God. This is an answer Leibniz vehemently rejects, however. According to the dispositionalist approach, his own solution instead consists in recovering the idea of powers or dispositions as basic ingredients of reality.[11] This line of thought is eloquently summed up by Robert Adams, who connects "Leibniz's

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[10] Henceforth I follow Leibniz in using 'form' for 'substantial form' and 'form', 'nature' and 'essence' interchangeably. In the spirit of his revisionary project, he typically ignores technical Aristotelian distinctions between different forms (accidental and substantial) and between nature, substantial form, and essence.

[11] On Leibniz's criticism of occasionalism and on powers as grounding laws of nature, see e.g. Garber, *Leibniz*, 127–79; Rutherford, "Laws and Powers," 149–60; McDonough, "Causal Powers," 153–56.

reasons for holding that there must be real powers or forces not only in God but also in created substances" to what he calls the "perennial appeal" of powers:

> If there is more to the causal order of the world than just the observable regularities of nondispositional fact, and if the laws of nature are not freestanding features of the world, it remains that there must be a feature (or features) of one or more objects or substances by virtue of which the regularities of nature obtain. . . . On the most influential and, I think, the most plausible accounts, it is a dispositional property of the things to which it belongs—a power or tendency or perhaps a liability.[12]

Despite its initial appeal, I believe such a reading misses critical aspects of Leibniz's preoccupation with powers. To see why, we need to consider more closely what distinguishes Leibnizian from Aristotelian powers and forms.

3. Power, Force, Activity

Following the widespread view of Leibnizian substances as akin to Cartesian minds, commentators (including Adams) often locate the distinctive nature of Leibnizian powers in their being essentially

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Commentators explicitly framing the issue in terms of powers as dispositions include Adams *Leibniz*, 312–13; Jolley "Leibniz and Occasionalism," 129–33; Liske "Harmonizing," 123–24.

[12] Adams, *Leibniz*, 313.

mental, in their being powers for producing perceptions.[13] Yet such a reading also faces some well-known difficulties.

If substances are causally isolated minds, it seems that metaphysical forces must be distinct in *kind* from corporeal forces.[14] When I bend a paper clip, the force would not change its shape, but must instead produce a sequence of hand and paper clip perceptions. The trouble, however, is that Leibniz fails to make such a sharp distinction. As we just saw, he explicitly speaks about the notion of force in his *dynamics* as bringing "the strongest light to bear upon our understanding of the true *notion of substance*" (*Emendation*, GP IV.469–70/L 433). Moreover, he readily characterizes the forces by which "bodies actually act on one another and are acted upon by one another [*corpora actu in se invicem agunt aut a se invicem patiuntur*]" as *derivative forces*, that is, as modifications or accidents immediately related to a substance's form or *primitive force* (*Specimen dynamicum*, 1695, GM VI.237/L 437). Derivative forces, he proclaims, are "exerted in various ways through a limitation, as it were, of the primitive force, resulting from the collision of bodies with each other [*primitivae velut limitatione, per corporum inter se conflictus resultans, varie exercetur*]" (*Specimen dynamicum*, GM VI.236/L 436).[15] I will get back to the primitive/derivative force distinction in more detail below. For now, it suffices to note that Leibniz himself does not seem to find it problematic to write as if metaphysical forces are directly involved in the corporeal world.

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[13] Adams, *Leibniz*, 316–20. See also Rutherford, "Idealism Declined," 230–31; Rozemond, "Leibniz on Final Causation," 279–90.

[14] See e.g. McDonough, "Foundations," 11–12; Adams, *Leibniz*, 385–86. That physical and metaphysical forces are distinct in kind need not mean that they are distinct kinds of *entities*: for Adams 'physical force' is just a different way of describing metaphysical forces.

[15] Cf. *On Body and Force* (original untitled), 1702, GP IV.397/AG 254; Leibniz to Jaquelot, March 22, 1703, GP III.457/WF 201.

In response to such difficulties, some scholars have sought to diminish the gap between physics and metaphysics by arguing that Leibnizian substances are in fact more robustly corporeal. These attempts have typically focused on whether his ontology (at least during some period) includes composite substances and, connectedly, on the status of what he terms *passive force* (associated with impenetrability and resistance).[16] In my view, the main problem with mind-centered interpretations lies elsewhere: in their failure to do justice to the importance Leibniz accords to *active force*.

Active force (*vis activa*) is what I have thus far referred to as *force*, following Leibniz himself, who frequently uses 'force' *tout court* for active force. The latter, he explains, is what "one usually calls 'force' in the absolute sense [*absolute vis dici solet*]" (*On Body and Force*, GP IV.395/AG 252). Although often employing the terms 'force' and 'power' interchangeably, Leibniz clearly takes force to be the basic notion, aiming to offer a new account of power as (active) force:

> Active force differs from the mere power familiar to the Schools, for the active
> power or faculty of the Scholastics is nothing but a close possibility of acting,
> which needs an external excitation or a stimulus, as it were, to be transferred into
> action. Active force, in contrast, contains already a certain act or entelechy and
> is thus midway between the faculty of acting and the act itself and involves a

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[16] Prominent examples include Phemister, *Natural World*, 31–80; Garber, *Leibniz*, 155–72, 303–88; Arthur, *Monads*, 47–82, 219–37.

conatus. It is thus carried into operation by itself and needs no help but only the

removal of an impediment. (*Emendation*, GP IV.469/L 433)[17]

The contrast between force and the "mere" faculties or powers of the scholastics is a frequent theme in Leibniz's writings.[18] He not only says that force is more intelligible than faculties, but flatly declares, "There is nothing in nature more intelligible than force" (Leibniz to Bossuet, July 12, 1694, A II.ii.827/WF 34).[19] Sometimes he even goes as far as asserting that faculties are utterly unintelligible (*NE* 140).

The sweeping references to his target ("scholastics") suggest that he views himself as debunking a fundamental assumption of the Aristotelian framework. This assumption, as Leibniz sees it, also bears on the very nature of substance. Thereby his own reconception of power as force implies a reconception of substance itself. Indeed, it is specifically the notion of force that is supposed to illuminate "the true *notion of substance*" (*Emendation*, GP IV.469/L 433). In the *Specimen dynamicum*, he further writes: "Whether we call this principle 'form' or 'entelechy' or

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[17] "Differt enim vis activa a potentia nuda vulgo scholis cognita, quod potentia activa Scholasticorum, seu facultas, nihil aliud est quam propinqua agendi possibilitas, quae tamen aliena excitatione et velut stimulo indiget, ut in actum transferatur. Sed vis activa actum quendam sive ἐντελέχειαν continent, atque inter facultatem agendi actionemque ipsam media est, et conatum involvit; atque ita per se in operationem fertur; nec auxiliis indiget, sed sola sublatione impedimenti."

[18] Consider also the draft of the *New System*: "By 'force' or 'power' I do not mean a capacity or a mere faculty . . . instead I mean something midway between capacity and action, something which involves an effort, an act, an entelechy [*Par la Force ou Puissance je n'entends pas le pouvoir ou la simple faculté . . . mais j'entends un milieu entre le pouvoir et l'action, qui enveloppe un effort, un acte, une entelechie*] " (GP IV.472/WF 22). See further *Specimen dynamicum*, GM VI.235/AG 118; *On Body and Force*, GP IV.395/AG 252; *NE* 169.

[19] "On ne trouvera rien dans la nature qui soit plus intelligible que la force." Cf. Leibniz to L'Enfant, December 5, 1693, A II.ii.753.

'force' does not matter, as long as we remember that it can only be explained through the notion of *forces*" (GM VI.241–42/AG 125; emphasis added).[20] This is also the import of characterizing substantial form as *primitive force*: "The forms of the ancients or entelechies are nothing but forces" (Leibniz to Bouvet, December 12, 1697, A I.xiv.833/W 104).[21]

What then is the widespread Aristotelian assumption Leibniz means to challenge? What makes force so radically different from Aristotelian powers and forms? And what accounts for its special intelligibility? These issues have received relatively little sustained attention, presumably because commentators simply assume that mind is the central notion for Leibniz. A recent exception is Julia Jorati, who attempts to take at face value the idea of force *qua* force, independently of reference to mind, as the most fundamental notion in Leibniz's metaphysics.[22] Drawing on the *Emendation* and similar passages, she suggests the following main difference between Aristotelian powers (simple faculties) and forces: "The former require an external stimulus in order to be manifested, while the latter are manifested without a stimulus. Forces in the fuller sense are manifested whenever they are not masked, or prevented from being manifested."[23] In

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[20] "Id principium Formam, an ἐντελέχειαν, an Vim appellemus, non refert, modo meminerimus per solam *virium* notionem intelligibiliter explicari."

[21] "Les formes des anciens ou entelechies, ne sont autre choses que les forces." Cf. Leibniz to Bernoulli, November 18, 1698, A III.iii.943/AG 168. The passages cited are mainly from the 1690s. Garber contends that later on force "loses its foundational status: primitive force gets folded into the perceptual life of non-extended perceiving things" (*Leibniz*, 319). This claim is not obviously supported by the texts, however. Leibniz continues to emphasize the fundamentality of force until the end of his career. Consider, for example, a letter to Rémond from November 4, 1715: "the entelechy of Aristotle . . . is nothing other than force or activity [*L'Entelechie d'Aristote . . . n'est rien d'autre chose que la force ou l'activité*]" (GP III.657). *Pace* Garber, the reason Leibniz's most elaborate treatments of force are from the 1680s and 1690s may simply be that this is the period when he is working out his position.

[22] See also Arthur, *Monads*, 219, 291.

[23] Jorati, "Leibniz's Ontology of Force," 204.

other words, Leibnizian powers are what we may call *self-manifesting* dispositions, "striving" to manifest themselves.[24] On such an interpretation, what is distinctive about Leibniz's position is that he replaces the Aristotelian thesis that everything that moves is moved by another with a view of *all* powers as self-manifesting dispositions. His criticism of Aristotelianism would thus rest squarely on the spontaneity thesis, the unintelligibility of faculties boiling down to the supposed unintelligibility of causal interaction.[25]

Yet it is unclear how essential the spontaneity thesis is to Leibniz's notion of force. Central passages contrasting forces to faculties are found in discussions of corporeal forces, where spontaneity is not at issue.[26] I return to this point in section 7 below. First, I wish to raise an even more pressing problem not only for Jorati's reading, but for the very idea of Leibnizian forces as dispositions.

While Leibniz's talk of force in terms of *conatus* or *tendency*[27] may sound dispositional, another key characteristic of force sits less well with the dispositionalist framework. As we saw, Leibniz stresses that force, in contrast to Aristotelian faculties, is something *actual*, an *entelechy* (*Emendation*, GP IV.469/L 433).[28] If this just means that forces are self-manifesting dispositions,

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[24] Accordingly, Jorati reads the primitive/derivative force distinction as a distinction between general and specific dispositions ("Leibniz's Ontology of Force," 215).

[25] Jorati also suggests that Leibniz may be worried that the thesis that everything that moves is moved by another leads to a regress ("Leibniz's Ontology of Force," 206). But surely Leibniz was well-aware that the Aristotelian chain of movers terminates in God, the unmoved mover.

[26] See e.g. *Specimen dynamicum*, GM VI.235–36/AG 118–19. Cf. Leibniz to Jaquelot, March 22, 1703, GP III.457/WF 200.

[27] He uses 'conatus' and 'tendency' interchangeably: see e.g. *On Body and Force*, GP IV.395/AG 252.

[28] Cf. *On Body and Force*, GP IV.395/AG 252; *New System*, draft, GP IV.472/WF 22; *NE* 216. Sometimes Leibniz reserves 'entelechy' for primitive forces and 'tendency' or 'conatus' for derivative forces (e.g. *NE*

already striving to actualize, his point does not seem particularly compelling against Aristotelians, who famously distinguish between *first* and *second* actuality or entelechy—between a substance with a set of basic potencies and the actualization of those potencies. Thus, Aristotelian powers are actual *as powers* even though they are not actualized: a birch actually has the power to grow even in the winter.[29]

The dispositionalist framework also makes it difficult to understand a further key implication of the idea of force as entelechy. As Leibniz asserts in the *Emendation* passage quoted above, force "contains already a certain act or entelechy and is thus midway between the faculty of acting and the action itself" (GP IV.469/L 433). Now, it is essential to dispositions that they can, at least in principle, be "masked," that is, prevented from manifesting. But how could a masked disposition be described as *midway* towards action? In fact, the very idea of masking seems foreign to Leibnizian force. He insists that action *always* follows from force: "I say that this power of acting inheres in all substances and that some action always arises from it" (*Emendation*, GP IV.470/L 433);[30] "True powers are never simple possibilities; there is always tendency, and action" (*NE* 112).[31] When Leibniz describes force as impeded, he does not have in mind masking, but rather that force "does not always *fully* attain the action toward which it tends [*non semper integre procedat ad actionem ad quam tendit*]" (*On Body and Force*, GP IV.395/AG 252, emphasis added).

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169). The shifting terminology, however, suggests that the distinction is not deep. Indeed, I argue below (sections 6 and 7) that primitive and derivative forces are not fundamentally distinct kinds of force.

[29] Scholastic Aristotelians commonly regarded powers as forms or qualities (Pasnau, *Metaphysical Themes*, 536). On the first/second actuality distinction see section 4 below.

[30] "Hanc agendi virtutem omni substantiae inesse ajo, semperque aliquam ex ea actionem nasci."

[31] "Les puissances veritables ne sont jamais des simples possibilités, il y a tousjours de la tendence et de l'action."

To explain the sense in which force is an entelechy, we need to invoke another notion Leibniz uses to characterize force, namely *activity*. Although frequently overlooked in the literature, activity, I will argue, constitutes the essence of Leibnizian force.[32] According to a central passage from the *New System*, forces "do not contain only *act* or the completion of possibility, but even an original *activity* [*ne contiennet pas seulement* l'acte *ou le complement de la possibilité, mais encor une* activité *originale*]" (GP IV.479/AG 139).[33] Here 'activity' does not simply connote being active as opposed to passive—originating as opposed to undergoing change—but is Leibniz's rendering of Aristotle's *energeia*.[34] Explicating his point requires some work, however. First, some elaboration on the Aristotelian notion of *energeia* is necessary.[35]

In *Metaphysics* IX.6, Aristotle distinguishes two kinds of operation (*praxis*): *kinesis* and *energeia*.[36] *Kinesis* is a process with an internal limit in the sense of being directed to a non-actual end-state, in the way a sapling's process of growth is directed to its full size. In contrast, *energeia* lacks internal limit, is not directed to an end-state. For Aristotle, the paradigm of *energeia* is living.

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[32] An important exception is Bolton, "Substance," 116n32. Robinet (*Architectonique disjonctive*, 78–79) and Arthur (*Monads*, 111–12, 133–35) both mention the significance of *energeia* for Leibniz without, however, noting the connection to Aristotle.

[33] Leibniz is specifically concerned with *primitive force*, but since I see him as having a *single* notion of force, it is this notion I take him to elaborate here.

[34] See e.g. *On Nature Itself* (*De ipsa natura*), 1698, GP IV.504/AG 156; Leibniz's remarks on Lamy, 1702, GP IV.588/WF 163; Leibniz to Masham, July 10, 1705, GP III.368. Cf. Leibniz's extensive notes from mid- to late 1680s (A VI.iv.1317) on Fogel's discussion of Aristotle's *energeia* (*Lexicon philosophicum*, 69–70).

[35] For illuminating accounts of the intricacies of Aristotle's position (which I cannot do full justice here) see Beere, *Doing*, 155–260; Kosman, *Activity*, 37–86; Waterlow, *Nature*, 183–91.

[36] I will ignore Aristotle's further employment of 'energeia' for *entelechia* in the sense of actuality in general (see Beere, *Doing*, 155–67).

Other instances, such as perceiving and understanding, are *ways* of living, characteristic of animal and rational life, respectively.

The distinction between *kinesis* and *energeia* corresponds to a distinction between two kinds of actuality or completeness: (i) actuality as an end-state, completing a *kinesis*; and (ii) actuality as *energeia*, where the operation itself is complete at any moment.[37] But how is life an example of something complete at any moment? Is not life rather a temporally extended process, consisting in successive stages? To appreciate Leibniz's use of *energeia*, it helps to distinguish two dimensions of life: (a) life as a succession; and (b) life as *living*, something going on at any point of, persisting throughout, this succession. *Energeia* denotes the second dimension: at any moment of the temporally extended process of life the *energeia* of living is fully present.

Now, for Aristotle, what is complete has the character of an end—that for the sake of which something is done. To say that *energeia* is complete at any moment thus also amounts to a positive statement about its end or *telos*. Although not directed to some *further* end, *energeia* is an end *in itself*: living is complete at any moment because undertaken for its own sake. This is why activity is the fundamental dimension of life. Completeness is not to be found in life conceived as a succession, but in the activity of living.

Against this background, we can better appreciate the *New System* claim that forces "do not contain only *act* or the completion of possibility, but even an original *activity*" (GP IV.479/AG 139). The sentence construction is not entirely transparent, but I read Leibniz as contrasting actuality as end-state ("*act* or the completion of possibility") to the sense in which force is actual— namely as activity or *energeia*. In saying that force "contains" activity, he is offering an explication

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[37] Famously, Aristotle says that in the case of *energeia* it follows from S's φ-ing that S has φ-d (1048b30–34).

of the nature of force: force is ultimately an activity.[38] In other words, to conceive power as force is just to conceive it as activity. I will refer to this as the *power as activity thesis*.

What is the import of this thesis? The initial impression is of a somewhat convoluted dialectic. First, Leibniz proposes force as an alternative to the Aristotelian account of power and form, and then goes onto explain force by appealing to another Aristotelian notion—entelechy in the sense of activity or *energeia*. Moreover, it is not obvious what activity has to do with power. As complete at any moment, as lacking directedness to some further end, activity seems essentially manifest. In that case, however, the power as activity thesis simply looks like a category mistake, at least on the prevalent understanding of powers as dispositions.

To address these concerns, we need to move beyond the dispositionalist approach. I will argue that Leibniz's target is the very conception of powers as *potencies* directed towards some further actuality. What is ultimately at issue is the distinction between first and second actuality, a keystone of the Aristotelian framework. Appreciating this point requires taking into account an important difference between the Aristotelian position and contemporary views of powers as dispositions. Thereby we will also better understand the challenge the mechanistic conception of the natural world presents for Aristotelian powers, a challenge that forms a crucial backdrop to Leibniz's power as activity thesis.

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[38] Elsewhere he also uses 'force' and 'activity' interchangeably: see e.g. Leibniz to Bernoulli, November 18, 1698, A III.vii.944/AG 169; Leibniz to Rémond, November 4, 1715, GP III.657.

4. Aristotelian Powers, Levels of Actuality, and the Mechanistic Challenge

In the *Physics*, Aristotle offers a well-known characterization of *kinesis* (Latin: *motus*) as "the actuality of what is in potency, as such" (201a11), which remained highly influential in scholastic thinking. The details are a matter of scholarly controversy, but this much seems clear: according to Aristotle, a *kinesis*, a process, consists in a potency or power that is incompletely actualized.[39] Aristotle thus invokes power to address the question of *what* a process is, rather than the dispositional question of *why* change occurs. As a potency inherently directed to some further actuality, a power can of course help to explain dispositionality, but its fundamental role is to serve as the constitutive basis of a process.

The need for such a constitutive basis may not be obvious. We often think of a process as simply a temporally extended sequence of stages or events appropriately related to one another. From an Aristotelian perspective, such a *successive entity* would be deeply problematic, however. Anything merely successive, merely having existence over time, would have counted as a being of reason—partly due to considerations about the status of time itself. [40] According to an influential current within scholastic thought, the reality of successive entities requires a ground in an enduring or, to use the technical term, *permanent* entity (*ens permanens*).[41]

For Aristotelians, the reality ultimately underlying processes are obviously substances, the ultimate subjects of change. Yet substances are subjects of change *because* they are *loci* of powers: it is by virtue of its powers that a substance is fully present throughout a process. Powers are both

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[39] For illuminating discussion see Coope, "Change," 278–87. On scholastic developments of the view see e.g. Maier, "The Nature of Motion"; Trifogli, "Change, Time, and Place," 268–72.

[40] See Maier, "Motus," 19–20.

[41] On the successive/permanent distinction and powers as permanent, see Pasnau, *Metaphysical Themes*, 374–98.

permanent and have a *dynamic nature*, capable of internal variation. The latter idea is what Aristotelians articulate in terms of the notion of potency admitting of degrees of actualization. As the source of its various powers, the form or nature functions as a principle of motion and rest, constituting a substance as a real ground of processes.

The importance of the constitutive role of powers helps to explain why they came to seem exceedingly problematic in light of the mechanistic world-picture. First of all, the conception of powers as potencies is premised on *kinesis* as the basic kind of process in the universe. The degrees of actualization of powers correspond to the way a *kinesis* (such as growth) can be more or less accomplished (more or less close to the full size of the plant).[42] In contrast, the mechanistic view takes uniform motion as basic: the kind of processes Aristotelians see as primordial (the growth of a birch, a cow's grazing) result from the way the uniform motions of parts of complex bodies vary as they interact with each other and environing bodies. On such a view, the claim that motion consists in the actualization of a potency directed towards some end-state makes little sense. A body changing place at the same rate along a straight line has a *direction*, but is not *directed towards* an end-point. Lacking internal limit, a body in uniform motion only stops when it meets an obstacle.

Secondly, the mechanistic picture puts pressure on the thesis that substances with their powers belong to a level of actuality *ontologically prior* to operation.[43] This amounts to undermining the foundational Aristotelian distinction between *first* and *second actuality*.[44] In fact,

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[42] For Aristotle, there are also potencies for *energeiai*, but it is fair to say that *kinesis* remains the fundamental case.

[43] Full actuality, however, is prior in other senses: (i) with respect to the end (the nature of a power is determined by the end towards which it is directed); and (ii) with respect to generation and actualization (what is in potency is brought to actuality by something actual). See Aquinas, *De principiis naturae*, ch. 4.

[44] The distinction is prominently expressed in Aristotle's gloss on the soul as "the first actuality of a physical body potentially having life" (412a28) and remained commonplace in Aristotelian thought. Aquinas writes,

the plenum mechanistic view Leibniz, following Descartes, espouses, even challenges the very

intelligibility of an ontological priority of first actuality over operation.[45] According to the plenum

view, bodies are patterns or arrangements within a fluid-like matter. As motion is responsible for

all differentiation within the plenum, these patterns are essentially patterns of *motion* and bodies

thus tremendously (infinitely) complex dynamical systems. The parts of complex bodies, such as

a cow, are themselves patterns of motion and the same goes for the parts of the parts, and so on.[46]

Unlike the Aristotelian universe, the plenum world is not built up from individuals exemplifying

common natures. The diversity within the plenum, including, for example, the Bessie-the-cow-

system, results from fixing the global motion structure. By going beyond Bessie's operations, we

do not reach a deeper level of powers constituted by cow form, but simply lose Bessie altogether:

all we are left with is homogenous matter and its basic invariants (the laws of nature common to

all bodies).

We can still truly talk of Bessie as having abilities to, say, graze, digest, and move about,

since the Bessie system contains salient stabilities, allowing her to respond to her environment in

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"The first act is said to be in potentiality to the second act, which is operation [*actus primus dicitur in potentia respectu actus secundi, qui est operatio*]" (*ST*, Ia, q.76, art. 4., ad1). See also Stump, *Aquinas*, 65–67. Suàrez characterizes power (*potentia*) as "a kind of first act, which has a relation to the second; but the second, proximal and immediate, act of any power is nothing but either action or passion [*actus primus, qui dicit habitudinem ad secundum; sed actus secundus proximus et immediatus alicuius potentiae non est nisi aut actio, aut passio*]." (*Disputationes metaphysicae*, disputation 43, section 1, paragraph 6) The distinction is similarly stated in some seventeenth-century overviews of Aristotelian thought, which Leibniz studied carefully: Weigel, *Corporis pansophici pantologia*, 57; Fogel, *Lexicon philosophicum*, 70, 100. For Leibniz's notes on these works, see A VI.iv.1190; A VI.iv.1317.

[45] I am indebted to Carriero's discussion of a parallel point in Spinoza ("Conatus," 83–82).

[46] See e.g. *On Nature Itself*, GP IV.512–13/AG 163. While the material plenum is not fundamental for Leibniz, his account of ultimate reality retains key aspects of the plenum picture (see below, section 7).

determinate "cowly" ways. Yet it would be a mistake to think, with Aristotelians, that we thereby track a basic order of nutritive and locomotive potencies grounded in cow form. Ability talk is a mere surface description, the truth of which depends on the internal motion structure of dynamical systems. This is why, from a plenum perspective, appeals to powers and forms are not only explanatorily idle, but outright unintelligible—a matter of reversing the order of nature, to borrow Spinoza's expression.

5. Activity and the Mechanistic Challenge

The constitutive role of powers is at the center of Leibniz's reappraisal of Aristotelian metaphysics. Echoing the Aristotelian position, he argues that force is needed to constitute the *reality* of motion: "Motion is a successive being, which consequently never exists, no more than time, since all of its parts never exist together: instead of this, I hold that force or effort exists wholly at each moment and has to be something true and real" (Leibniz to Pellisson, July, 1691, A II.ii.434).[47] The importance of this issue to Leibniz is understandable, as it concerns the reality of the mechanistic universe itself. Deprived of powers, bodies, as essentially patterns of motion in the plenum, will turn out to be mere successive entities, lacking any real ground.

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[47] "Le mouvement est une chose successive, laquelle par consequent n'existe jamais, non plus que le temps, parce que toutes ses parties n'existent jamais ensemble: au lieu de cela, dis-je, la force or l'effort, existe tout entier à chaque moment, et doit estre quelque chose de veritable et de réel." Cf. Leibniz to Jaquelot, March 22, 1703: "Motion is not a being, any more than is time, since it has no coexisting parts, and so can never exist. But force subsists and can endure [*Aussi le mouvement n'est il point un estre non plus que le temps, n'ayant point les parties coexistentes et par consequent n'existant jamais. Mais la force est subsistante et peut durer*]" (GP III.457/WF 200). See also *Specimen dynamicum*, GM VI.235/AG 118. For a detailed analysis of this argument see Myrdal, "Force."

Yet bringing back powers in the context of the mechanistic framework also means facing the challenge that framework poses to the intelligibility of powers. Without denying the significance Leibniz attributes to powers in grounding the laws of nature, it is, I propose, the need to meet the challenge to their constitutive role that motivates his power as activity thesis. What the notion of activity offers is a way of working out a conception of power adequate to the plenum world.

This suggestion may seem perplexing given that activity (*energeia*) is itself an Aristotelian notion. Leibniz, however, seeks to develop a dimension of it largely unexplored within Aristotelian thought. I take it to be precisely this dimension he intends to bring out in describing force as "midway between the faculty of acting and the action itself" (*Emendation*, GP IV.469/L 433). Action is succcessive,[48] whereas activity, despite being an operation, is permanent. As such activity is analogous to power: just as power, activity endures *throughout* a process, in the way the activity of living is supposed to be fully present throughout the successive process of life. Force as activity is then "midway" between faculty and action in that like action, but unlike an Aristotelian power, force is an *operation*, but unlike action, and like an Aristotelian power, *permanent*.

It is not surprising that Aristotelians neglected the connection between activity and power, since they already had in place the conception of power as potency. Nor is it surprising, however, that Leibniz explores that connection in formulating an alternative account of power. As a permanent *operation*, activity has a dynamic nature, but is not, in contrast to a potency, directed to an end-state. In this way, we can begin to see why activity would have appeared as a promising

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[48] "Action and power are different things, the former successive, the latter permanent [*actio et potentia res sunt diversae, illa successiva, haec permanens*]" (*On Nature Itself*, GP IV.509/AG 160). Cf. *On Body and Force*, GP IV.396/AG 253; Leibniz to Jaquelot, March 22, 1703, GP III.457/WF 200; *Theodicy*, §87/GP VI.150/H 170.

candidate for an account of power suited to the unending character of uniform motion. Taking seriously the constitutive role of powers also helps to explain Leibniz's claim that some action always arises from force (*Emendation*, GP IV.470/L 433). Action does not follow from force as a further effect, but rather as *constituted* by the continued operation of force: "Action is nothing other than the operation of force over time" (Leibniz to De Volder, April 6, 1699, A II.iii.550/LDV 81).[49] Now, according to Leibniz, time is a continuous quantity, not composed of instants.[50] Force operating in time thus necessarily operates over a temporal interval, however short. Even though force itself is not temporally extended—as permanent force is fully present throughout that interval—there will always be some temporal succession, action, corresponding to its operation.

What then about Leibniz's talk of force as *tendency*—does not this still suggest a dispositional understanding of force? While often using 'force' and 'tendency' interchangeably, he is sometimes more careful. In the *Specimen dynamicum*, he characterizes force as "*endowed* with *conatus* or *nisus* [*conatu sive nisu instruitur*]" (GM VI.235/AG 118; first emphasis added) and goes onto speak of "force and the nisus *arising* from it [*vis et nascens inde nisus*]" (GM VI.252/AG 135, emphasis added). This sharply contrast with the dispositionalist approach. Rather than conceiving force through a *prior* notion of tendency—a directedness towards some manifestation—Leibniz suggests that tendency is in fact *derivative* on force. This fits well with a natural way of thinking of uniform motion: it is *because* a body is already in motion that it has a tendency to go further. More generally, tendency as ontologically posterior fits the project of grounding the reality of plenum systems. From a plenum perspective, it seems more plausible to see Bessie's tendency to move towards a patch of grass as arising from a pattern of activity or operation—corresponding to

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[49] "Actio nihil aliud est quam exercitium virium per tempus." Cf. Leibniz to De Volder, June 30, 1704, A II.iv.251/LDV 307; *On Body and* Force, GP IV.396/AG 253.

[50] For a clear statement see *NE* 152.

the tremendously complex internal goings-on in her digestive and sensory systems—than as an inclination of her locomotive faculty actualized in her movement.

Note that 'arising from' need not be read in a reifying way. In moving with uniform velocity a body has a tendency to continue in virtue of its force. This tendency is not really an additional posit—it is just that in moving uniformly, a body *ipso facto* tends to go further. Similarly, Bessie's tending towards the grass can be seen as a mere "aspect" of her current pattern of activity, rather than as an extra ingredient.

The ontological priory of force makes for an original approach to dispositionality. For Leibniz, it is in virtue of its force or activity that thing is disposed to some further development (effect). Indeed, he explicitly distinguishes his own "particular dispositions" from Aristotelian faculties or potencies:

> But faculties without any act—in short, the pure powers of the Schoolmen—are
> also mere fictions, unknown to nature and obtainable only by abstraction. For
> where will one ever find in the world a faculty consisting in sheer power without
> performing any act? There is always a particular disposition to action, and
> towards one action rather than another. And as well as the disposition there is a
> tendency towards action—indeed, there is an infinity of them in any subject at
> any given time, and these tendencies are never without some effect. (*NE* 110)[51]

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[51] "Mais les facultés sans quelque acte, en un mot les pures puissances de l'école, ne sont aussi que des fictions, que la nature ne connoist point, et qu'on n'obtient qu'en faisant des abstractions. Car où trouverat-on jamais dans le monde une faculté qui se renferme dans la seule puissance sans exercer aucun acte? il y a tousjours une disposition particuliere à l'action, et à une action plustost qu'à l'autre. Et outre la disposition il y a une tendence à l'action, dont même il y en a tousjours une infinite à la fois dans chaque sujet: et ces tendences ne sont jamais sans quelque effect." Cf. *NE* 112, 140.

While Aristotelian potencies are typically *general*, allowing for different ways of actualizing, tendency or operation underwrites dispositions to *particular* effects. [52] What Bessie's pattern of activity grounds is not a general inclination to locomotion, but a directedness to, say, going towards a particular patch of grass—just as the force of a body in uniform motion grounds a directedness to moving to the next position along the tangent.

Leibniz's charge against the intelligibility of Aristotelian faculties not only concerns dispositionality, however. Ultimately, his target seems to be the very notion of first actuality. The claim that faculties are "abstractions" from a multitude of tendencies reflects the mechanistic worry that Aristotelians reverse the metaphysical order, projecting surface descriptions, detached from their metaphysical foundation, onto the level of basic ontology. This helps to explain Leibniz's dismissal of Aristotelian powers as "bare" (*nuda* or *nuës*):[53] the problem is that they are bare in the sense of being prior to operation. Herein lies, I surmise, the heart of the power as activity thesis. Fundamentally, activity allows Leibniz to reconceive the reality of processes without appealing to an Aristotelian first actuality, that is, without going beyond operation. This is also why forces are more intelligible than Aristotelian powers. What grounds the reality of infinitely complex patterns of motion are not faculties or potencies but infinitely complex patterns of activity.

Emphasizing the way Leibniz's conception of powers is informed by the plenum mechanistic picture is not to ignore the all-important distinction between the corporeal and

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[52] I take Leibniz's point to be that corresponding to the infinity of tendencies there is an infinity of particular dispositions. In contrast, Jorati reads 'disposition' as "the overall, all-things-considered tendency of a substance," and 'tendency' as "the individual inclinations of that substance" ("Leibniz's Ontology of Force," 194n13). The problem is that such a reading leaves it unclear how Leibniz differs from the Aristotelian view.

[53] See e.g. *Emendation*, GP IV.469/L 433 (quoted in section 3 above); *NE* 140.

metaphysical orders. Quite the opposite: by appreciating the significance of the plenum view to his rethinking of powers, we can actually better understand why the notion of force belongs to metaphysics. Keep in mind that the mechanistic theory of processes proceeds from the bottom up, the complex behavior of bodies resolving into their uniformly moving parts. On a plenum view, such a resolution remains, however, an idealization: there is always a further level of more fine-grained complexity. Bodies are really *infinitely* complex patterns of motion.[54] In itself this need not be a problem, at least as long as we are simply doing physics. But difficulties arise as soon as we try to account for the reality of motion. Given that powers sustaining some elementary motions would be inadequate to the plenum picture, the only other option is to locate the real ground of processes in powers sustaining complex, non-uniform, motions. Yet such powers violate the mechanistic commitment to a bottom-up ontology. Somewhat paradoxically, finding powers suited to the plenum thus takes us outside the mechanistic framework.

From there the step is short to retrieving substantial forms. Traditionally, a substance was seen as a *top-down* ground of processes. In virtue of its form, a single substance (such as Bessie the cow) is the source of the various complex processes in which it engages (for instance, breathing, grazing, digesting), an idea Leibniz seeks to recover in characterizing the tendencies underlying bodily processes as *derivative* forces, as tendencies *of* a single form or primitive force.[55]

There is an important caveat, however. For Aristotelians, Bessie's form is a top-down source of her behavior in the sense of both *grounding the reality of* and *explaining* the various processes in which she engages. What explains Bessie's grazing is her exercising her nutritive and locomotive powers resulting from her form. It is also the actualization of these powers that is the

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[54] For helpful discussion see Levey, "Dans les corps," 150–55.

[55] Although its organic body is constituted by other organic bodies, an animal's primitive force involves tendencies corresponding to *all* the goings-on in its body (*NE* 116).

real ground of the successive process of grazing. Here Leibniz subtly, but significantly, parts company with Aristotelians. In proposing to "restore, and, as it were, rehabilitate [*rappeller et comme rehabiliter*]" substantial forms, he insists on doing so in a way that "separates the use one should make of them from the abuse that has been made of them [*separât l'usage qu'on en doit faire, de l'abus qu'on en a fait*]" (*New System*, GP IV.478–79/AG 139). For Leibniz, the goings-on in Bessie's organic body can be fully explained in mechanistic terms, in terms of its internal motions together with the motions of surrounding systems.[56] What he wants to retain is solely the role of form in grounding the *reality* of processes. In line with his criticism of the notion of first actuality, Leibniz also sets out to thoroughly rethink the nature of form. To understand this move, I will first sketch use of another dimension of the traditional notion of *energeia*—its connection to life.

6. Life Activity

The notion of life plays a prominent, but little discussed, role in Leibniz's account of substance.[57] In a noteworthy letter to Bernoulli, he repeatedly insists on the significance of life: "We ought to posit a seat or first subject of actions, namely a soul, a form, a *life*, a first entelechy, as I would like to call it" (November 18, 1698, A III.vii.944/AG 169, emphasis added)";[58] "entelechy, that is, primitive activity, soul, *life* [*Entelechiae seu Activitatis primitivae, Animae, Vitae*]" (November 18,

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[56] See Smith, *Divine Machines*, 59–93; Andrault, *La vie*, 205–39.

[57] See, however, Nachtomy, *Living Mirrors*, 188–200. Although stressing the connection between life and force in Leibniz, Nachtomy does not discuss the relation to *energeia*.

[58] "Debemus ponere sedem vel πρῶτον δεχτιχόυ actionum, nempe Animam, Formam, vitam, Entelechiam primam ut appellare lubebit."

1698, A III.vii 944/AG 169, emphasis added). Subsequent writings further emphasize the intimate connection between force and life: "This primitive active force, which one can call *life*, is . . . exactly what is contained in what we call a soul, or in simple substance" (*Conversation of Philarète and Ariste* [*Entretien de Philarete et d'Ariste*], 1712, GP VI.588/AG 264)."[59]

A mind-centered reading is likely to dismiss Leibniz's talk of life as simply an allusion to the Aristotelian view of living things as internal causes of change. Yet a focus on activity suggests it has a deeper significance. For Aristotle, living is not only the paradigm of *energeia*, but specifically relates to substance as a top-down ground. On the one hand, the activity of living is enduring, fully present throughout the temporally extended process of life. On the other hand, living essentially contains variation: it is part of the nature of Bessie's living that *in* living she breathes, grazes, digests, and so forth. As an *end in itself*, living is not reducible to a mere sequence of various operations. What Bessie does *in* living is *for the sake* of sustaining her living: just as it is part of the nature of Bessie's living that in living, she breathes, grazes, digests, and so forth, so it is part of the nature of these operations that they are undertaken within her overall enduring activity of living.

This idea, I think, helps to explain the role Leibniz gives to life in accounting for substance: life activity, as both enduring and internally varying, provides an articulation of what it is to be a real ground of complex processes. His conception of reality as a "realm" of final causes and of substances as appetitive beings (*M* §79) can then be seen as drawing on the way the teleological nature of Aristotelian life activity is manifested in appetites organized around a substance's proper

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[59] "Cette force active primitive, qu'on pourroit appeller *la Vie*, est justement . . . ce qui est renfermé dans ce que nous appellons une Ame, ou dans la substance simple." Cf. *On Body and Force*: GP IV.396/AG 253; Leibniz to Wagner, June 4, 1710, GP VII.529–30/W 504–5; *PNG* §1.

operation—its specific life activity, in the case of a living being.[60] This also yields an alternative understanding of Leibniz's characterization of substances as soul-like: rather than evoking the Cartesian view of soul as mind, it can be read as referring to the Aristotelian notion of soul as the first actuality of a living being.[61] To be sure, Aristotelians reserve sensory powers for animal forms of life, whereas Leibniz ascribes perception to all substances. It is not obvious how significant this difference is, however. If we start from the thought that living generally involves responsiveness to the environment, and hence a way in which information about it is registered, it does not seem that far-fetched to view all living beings as (in some sense) perceiving. Now, it is also true that for Leibniz substances have individual and not, as for Aristotelians, species natures. But even if the teleological structure of life activity may most naturally be construed in species-specific terms, it could presumably be developed in a more "individual" direction too: why could not Bessie's activity be primarily Bessie-specific, instead of primarily cow-specific?

There are several advantages to taking seriously the significance of life activity to Leibniz's account of substance. To begin with, life activity is more congenial than mentality to his so-called *panorganicism*, according to which the corporeal order is essentially an order of organic bodies in that also non-organic bodies are composed of organic bodies.[62] This means that, for example, the process of a ball's bouncing up and down is ultimately derivative on the organic processes of its constituent microscopic animals. The role of panorganicism in Leibniz's system may at first glance appear curious, since, for him, biology does not form a level of explanation distinct from physics.

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[60] According to Aquinas, "each thing has a natural inclination to perform its proper operation [*quaelibet res naturalem inclinationem habet ad suam propriam operationem*]" (*In Met.* I, lect. 1, n. 3).

[61] Carriero relatedly argues that Leibnizian substances are primarily end-governed, rather than mind-like ("Substance," 123–31).

[62] Rutherford, *Rational Order*, 201–4.

The thesis becomes better motivated, however, if the order of substances grounding the mechanistic universe is an order of life activity, since it seems plausible that life activity primarily grounds organic processes.[63] Placing life-activity at the center of Leibniz's notion of substance thus means that far from being a peculiar add-on, panorganicism is an immediate consequence of his theory of fundamental reality.

Secondly, understanding force as life activity makes it easier to see physics as directly concerned with metaphysical forces. Recall that, on the dispositionalist approach, forces are individuated by their manifestations. Now, if forces in physics are individuated by, for example, change of place at a certain rate or a certain amount of work, it is natural to think that they must differ in kind from metaphysical forces.[64] Yet, as *activity*, the fundamental nature of force is not dispositional, does not consist in a directedness towards some manifestation. That mv^2 measures the manifestation of the force of a body in motion—say, Bessie's body as she is running across a field—does not imply that mv^2 individuates a certain *kind* of force. It is thus open to Leibniz to hold that what is measured is actually Bessie's primitive force. It may be no accident that he terms the force measured by mv^2 *living force* (*vis viva*). As the *living* of her organic body, Bessie's primitive force is expressed as various corporeal processes falling within the purview of physics.

Of course, living force is not restricted to organic bodies, but *any* body in motion has living force—the bouncing ball or the rock in free fall no less than Bessie's body. Here, however, we need to remember that for Leibniz all bodies are constituted by organic bodies, also those that are not themselves organic, such as the ball or the rock. While the latter do not have life activities of

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[63] 'Grounding' here is meant to be neutral with respect to the ontological status of organic bodies, i.e. whether they are simply appearances (phenomena) of fundamental reality or have a more robust status.

[64] See e.g. Adams's formulation of the problem of the relationship of physical to metaphysical forces (*Leibniz*, 379–81).

their own, they nonetheless *contain* life activity. Rather than operating with a distinct kind of force, physics can be seen as simply abstracting from the fact that what it measures are tendencies within life activities. In Bessie's case, mv^2 sums up over the tendencies of a *single* life activity, and, in that of the ball, over the tendencies of the *plurality* of life activities of the ball's constituent animals.

Developing this suggestion would take us too far afield, since this calls for a more detailed discussion of Leibniz's dynamics and the complex issue of the metaphysical importance he accords to mv^2 as the measure of living force. At the end of next section, I will at least indicate why one seemingly major obstacle to a more unified account of Leibnizian force—namely, the spontaneity thesis—is in fact of less concern than often thought. First, we need to examine how Leibniz, while drawing on the traditional connection between activity and life, also reconceives the status and nature of life activity itself.

7. Form as Life Activity

For Aristotelians, the integrated nature of Bessie's life activity is rooted in her first actuality.   The unity of her operations, their hanging together within her living, depends on their actualizing the potencies endowed by her form. It is this notion of first actuality as prior to operation Leibniz seeks to challenge in rethinking the nature of form.

Let us begin by considering in full the well-known passage from the *New System*, laying out his reintroduction of forms:

> It was thus necessary to restore, and, as it were, to rehabilitate the *substantial forms* which are in such disrepute today, but in a way that would render them intelligible, and separate the use one should make of them from the abuse that has been made of them. I found then that their nature consists in force, and that

from this there follows something analogous to sensation and appetite, so that we

must conceive of them on the model we have of *souls*. But just as soul must not

be used to explain the particular details of the animal's body, I judged that we

must not use these forms to explain the particular problems of nature, even

though they are necessary to establish true general principles. Aristotle calls them

first entelechies; I call them, perhaps more intelligibly, *primitive forces*, which

do not contain merely *act* or the completion of possibility, but even an original

activity. (GP IV.478–79/AG 139)[65]

Commentators usually focus on the claim that the soul is a "model" for forms, that from force "something analogous to sensation and appetite" follows, reading this as implying that for Leibniz force entails mentality.[66] Not only is such an interpretation of Leibniz's talk of soul far from obvious, as we just saw, but it also seriously misconstrues the dialectic of the passage.

Leibniz draws attention to two ways he departs from the Aristotelian position: first, forms only have a metaphysically foundational, and not a scientific explanatory, role; secondly, he

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[65] "Il fallut donc rappeller et comme rehabiliter les *formes substantielles*, si décriées aujourd'huy, mais d'une maniere qui les rendist intelligibles et qui separât l'usage qu'on en doit faire, de l'abus qu'on en a fait. Je trouvay donc que leur nature consiste dans la force, et que de cela s'ensuit quelque chose d'analogique au sentiment et à l'appetit; et qu'ainsi il falloit les concevoir à l'imitation de la notion que nous avons des *ames*. Mais comme l'ame ne doit pas estre employée pour render raison du détail de l'oeconomie du corps de l'animal, je jugeay de même qu'il ne falloit pas employer ces formes pour expliquer les problemes particuliers de la nature, quoyqu'elles soyent necessaires pour établir des vrays principes generaux. Aristote les appelle *entelechies premieres*, je les appelle peutestre plus intelligiblement *forces primitives*, qui ne contiennent pas seulement *l'acte* ou le complement de la possibilité, mais encor une *activité* originale."

[66] See notably Adams, *Leibniz*, 316–20; Rozemond, "Leibniz on Final Causation," 282–90. Both omit the crucial last sentence in quoting the passage.

promises a "more intelligible" conception of the nature of form as force. The greater intelligibility does not have to do with mentality, however, but with the relationship between form and activity. As already explained, the power as activity thesis amounts to a rejection of the Aristotelian view of substance as first actuality, as prior to operation. At the same time, Leibniz seeks to retain the idea of substance as a top-down ground of the reality of processes. He thus needs a way of articulating this idea without appealing to the traditional notion of first actuality. In conceiving form as primitive force, Leibniz proposes that, rather than being ontologically posterior to form, activity is constitutive of form or first actuality itself. This is the significance of characterizing activity as *original*, as not consisting in the actualization of a prior set of potencies. Such a conception of form is more intelligible precisely because it undercuts the distinction between first and second actuality. What is fundamentally at issue between Leibniz and Aristotelians is not the question of whether soul is to be understood as mind, but the relationship between soul and life activity. For Leibniz, Bessie's soul does not *underlie* her living, but *is* her living.

The radical nature of this proposal comes out in Leibniz's transformation of the notion of appetite. For Aristotelians, appetite is based in potency: a particular appetite manifests a potency's natural inclination for its proper actuality.[67] In contrast, Leibnizian appetites are *derivative forces*, tendencies (*conati*) (*NE* 169–70; 172–73). As derivative force, appetite seems related to primitive force much the same way a body's tendency to go to the next position is related to its being in uniform motion. Derivative forces are states of primitive forces, or, more exactly, as Leibniz puts it, "Derivative force, however, is the present state itself insofar as it tends towards a following state" (Leibniz to De Volder, January 21, 1704, A II.iv 189–90/LDV 287).[68] Obviously, primitive

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[67] See e.g. Aquinas, *ST*, 1a, q. 78, art. 1, ad3.

[68] "Vis autem derivativa est ipse status praesens dum tendit ad sequentem."

force is internally rich, grounding a variety of tendencies (appetites) and these are not mere tendencies to go further, but are teleologically ordered, for the sake of sustaining activity. Still, appetite or derivative force does not belong to an ontological level more fundamental than operation, but is a mere *limitation* of primitive (or what he also terms *essential*) activity or force: "Derivative or accidental force . . . must be a modification of primitive force, just as shape is a modification of extension. Accidental forces could have no place in a substance without essential force, because accidents are only modifications or limitations, and can never contain more perfection or reality than does the substance" (Leibniz to Jaquelot March 22, 1703, GP III.457/WF 201).[69]

The analogy with extension hinges on the point that geometrical shapes do not stand to extension, conceived as Euclidean space, as actuality stands to potency. In describing a circle, we do not introduce some new actuality, but simply modify extension in the sense of delimiting something already fully actual. The analogy thus implies a novel understanding of the nature of a substance's modifications. Rather than adding further levels of actuality, the variations within Bessie's living are mere limitations of her primitive activity, in some sense already contained in that activity.[70] What underlies the process of grazing is just an aspect of Bessie's living, in virtue of which she also has a tendency to, for example, digest.

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[69] "La force derivative ou accidentelle . . . doit estre une modification de la primitive, comme la figure est une modification de l'etendue. Les forces accidentelles ne sauroient avoir lieu dans une substance sans force essentielle, car les accidens ne sont que des modifications ou limitations, et ne sauroient enfermer plus de perfection ou realité que la substance." Cf. *On Body and Force*, GP IV.397/AG 254; Leibniz to De Volder, November 19, 1703, A II.iv.181/LDV 277; June 30, 1704, A II.iv.251–52/LDV 307.

[70] I take it that Leibniz does not deny that a substance can increase in perfection, but only that such increase amounts to a transition from potency to actuality. His own characterization of perfection in terms of order,

Now, Leibniz also talks of form or primitive force as a "law" or "principle," but this does not mean that it is prior to operation. In fact, he typically *identifies* law and primitive force: "The essence of substances consists in the primitive force of acting, or in the law of the sequence of changes" (Notes on Foucher, undated, A VI.iii.326/L 155).[71] The notion of *law of the sequence of changes* (or *law of the series*) is supposed to signal that the very natures of individual things (*res singulares*), substances, involve change: "For me, nothing is permanent in those things except the very law that *involves* the continued succession" (Leibniz to De Volder, January 21, 1704, A II.iv.191/LDV 289, emphasis added).[72] In addition to functions in mathematics, it is to the case of uniform motion Leibniz turns to explain this point in a passage from a letter to De Volder worth quoting at length:[73]

> Whatever follows from the nature of a thing can follow either permanently or at a time, and if at a time either at once and immediately (namely, in the present) or with something prior mediating, so that it is in the future. You find an image of this in quasi-substances, that is, in bodies that have force or have been put in motion. When nothing external is assumed, it follows from the nature of a body moving in a given straight line with a given speed that it will arrive at a given point on the straight line when a given time has elapsed. . . . You should,

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harmony, and perceptual distinctness may be seen as an alternative to the potency/actuality model (e.g. *PNG* §§12–13).

[71] "L'essence des substances consiste dans la force primitive d'agir, ou dans la loy de la suite des changemens."

[72] "Nec mihi aliud in eis est permanens quam lex ipsa quae involvit continuatam successionem."

[73] For appeals to functions, see e.g. Leibniz's notes on Foucher, A VI.iii.326/L 155; Leibniz to De Volder, January 21, 1704, A II.iv.190/LDV 287.

accordingly, conceive in the primitive tendencies that which must be recognized

in the derivative. The situation is as it is with laws of series or the natures of

curves, where the entire progression is fully contained in the very beginning.

(November 19, 1703, A II.iv.182/LDV 279.)[74]

Scholars often favor of the mathematical examples over the analogy with uniform motion. Indeed,

there is a tendency to take the former as offering a straightforward account of primitive force.[75] I

believe the uniform motion analogy is actually more instructive. As has already been noted by

other commentators, the problem with the mathematical examples is that they fail to capture what

is arguably the core of the notion of law of the series: the law as *in itself* involving the continued

succession. In the case of curves or number sequences, beginning and law seem independent of

each other: the same argument in a different function, or the same function with a different

argument, yields a different continuation.[76]

As Leibniz presents it here, uniform motion is importantly different. The idea appears to be

that the force of a body moving uniformly can be thought of as law-like insofar as it remains

throughout, as well as determines, the body's trajectory. But unlike a law understood as a function,

force is not something general, requiring further input. The force present at the beginning is

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[74] "Quicquid ex natura rei sequitur, id potest sequi vel perpetuo vel pro tempore, et hoc vel statim immediate, nempe praesens, vel alio mediante anteriore ut futurum. Habes imaginem in quasi-substantiis, seu corporibus vim habentibus, sive in motu positis. Ex natura Corporis Moti in recta data velocitate data nullo extrinsecus assumto, sequitur ut dato tempore elapso perveniat ad datum in recta punctum. . . . Concipe igitur in primitivis tendentiis quod agnoscere oportet in dervivativis. Et res se habet velut in legibus serierum, aut naturis linearum, ubi in ipso initio sufficiente progressus omnes continentur."

[75] See e.g. Jorati, "Leibniz's Ontology of Force," 215; Cover and O'Leary-Hawthorne, *Substance*, 227–29.

[76] For a thorough treatment of this problem, see Cover and O'Leary-Hawthorne, *Substance*, 229–33.

sufficient to determine the further progression by remaining fully present throughout a body's trajectory. The role of the mathematical analogies is best understood as highlighting this aspect of activity, rather than as directly explicating primitive force. The point of characterizing primitive force as a law of the series would thus simply be to stress that activity, insofar as it is both permanent and determining, can fill the traditional role of form as a principle of operation without, however, being prior to operation.

Of course, as Leibniz's own qualifications indicate, also the analogy with uniform motion has limitations. It induces a view of force as invariant, since what changes is simply the location of the body. For Leibniz, it is, however, crucial that the activity constituting the nature of substance contains *internal* variation. This is what makes it a top-down ground of non-uniform processes and a genuine alternative to Aristotelian potencies actualized to different degrees. To properly fill out this idea we need to invoke life activity, determining, as their end, the various operations undertaken in living.

Seeing the power as activity thesis, and the related conception of form as life activity, as constituting the bedrock of Leibniz's theory of substance has some notable implications. First of all, this should prompt us to revisit the widespread assumption that the notions of law of the series and primitive force are bound up with the spontaneity thesis. Indeed, it seems impossible to get from spontaneity alone to activity (*energeia*). At most, spontaneity yields a notion of form as some sort of self-manifesting disposition for generating a substance's entire career. Nor is there any entailment in the other direction. The conception of form as activity merely implies that the nature of substance consists in operation, thereby being the source of *some* succession. This is compatible with holding that the form involves that succession—a substance's future states—as *in part*, rather than as *exclusively*, a function of its current state. That is, the conception of Bessie's nature as life

activity by no means rules out the possibility that the vicissitudes of her existence partly depend on external circumstances.

There is thus a simple explanation for why Leibniz readily talks of primitive force even in contexts where considerations about spontaneity are absent—namely that the spontaneity and power as activity theses are independent of each other. This is not to question his commitment to the spontaneity thesis. What I question is the foundational role usually accorded to spontaneity in accounts of Leibniz's metaphysics. If the reading defended here is on the right track, it is the power as activity thesis that forms the core of his theory of substance. And that thesis, once again, neither entails, nor is entailed by, the spontaneity thesis. What drives the power as activity thesis is instead, I have argued, the need to provide an account of the constitutive role of powers answering the mechanistic challenge.

The point has a parallel in Leibniz's discussion of bodies. Spontaneity not only pertains to the metaphysical realm, but also to the physical one, as he explains in the *Specimen dynamicum*: "*Every passion of a body is spontaneous, that is, arises from an internal force, even if it is on the occasion of something external*" (GM VI.251/AG 134).[77] Leibniz presents this as an additional thesis, not entailed by his basic notion of body. I suggest that something similar holds at the level of metaphysics: while it is true that substances are completely spontaneous, this does not follow from the power as activity thesis itself.[78]

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[77] "*Omnis corporis passio sit spontanea seu oriatur a vi interna licet occasione externi.*" For discussion and further references see Garber, *Leibniz*, 199–206.

[78] One might worry whether it makes sense to construe life activity as spontaneous. This a version of the much-debated question of the compatibility of end-directedness and spontaneity: see e.g. Rutherford, "Leibniz on Spontaneity," 157–61, 168–74; Bolton, "Change in the Monad," 186–91; McDonough, "Agency," 103–10; Jorati, *Agency*, 68–90. Without delving further into this issue, it should be noted that, if

Now, Leibniz not only says that the *form* of substance consists in activity. Taken at face value, his way of freely alternating between 'form', 'soul', and 'first actuality' implies that a substance *itself* somehow just *is* life activity.[79] Before dismissing this startling implication as a category mistake—a matter of confusing the subject of operation, the substance, with its operation—recall that, on the plenum view, it is far from clear that we can take the division between subject and operation for granted. Plenum Bessie is essentially a particular dynamical system, not to be understood in Aristotelian terms as a common nature (cowhood) individuated by matter. On my reading, this is an idea Leibniz seeks to retain in providing the metaphysical foundations of the plenum universe. The metaphysical order, too, is essentially an order of operation; we do not arrive at Bessie by going beyond what she is doing.[80]

Taking seriously the view that substance just *is* life activity offers a novel motivation for Leibniz's commitment to the simplicity of substances. Here we need to keep in mind the way his understanding of life activity differs from the Aristotelian one. On the latter, life activity belongs to second actuality insofar as it consists in the actualization of several distinct potencies (nutritive,

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there is indeed a tension here, it is, on my reading, a tension between the core of Leibniz's account of substance—the conception form as life activity—and the spontaneity thesis.

[79] Cf. *Theodicy*, §396/GP VI.352/H 360. I am sympathetic to readings of primitive passive force as a mere limitation of primitive active force, such as Antognazza, "Primary Matter," 177–85; Duarte, "Leibniz on Prime Matter," 439–48. Yet my point is also compatible with interpretations of it as a distinct ingredient of substance (see above, note 16).

[80] It is, however, misleading to characterize Leibniz as a "process philosopher" (Rescher, *Process Philosophy*, 5). Unlike Leibnizian forces, processes are typically considered to be temporally extended. Contemporary process metaphysics also tends to be reductivist or eliminativist about substance. Even Rescher's own unusually broad construal of process metaphysics as any view of reality as fundamentally dispositional (*Process Philosophy*, 7–9) is obviously inadequate to Leibniz, since his forces are *not* dispositions.

augmentative, and so forth). As such, it is also in some sense complex. In contrast, Leibniz holds, as we have seen, that a substance's particular operations are mere limitations or aspects of a prior single life activity. Leibnizian life activity can thus be characterized as lacking parts, that is, as simple. The simplicity of substance would thus follow from the simplicity of life activity itself: if substances just are life activities, and if life activity is simple, then substances too must be simple.

Rather than pursuing this somewhat speculative suggestion, I will limit myself to indicating a final upshot of distinguishing between the spontaneity thesis and the conception of substance as primitive force. The idea of spontaneity or causal isolation as essential to metaphysical force presents a major obstacle for seeing physics as concerned with the same kind of force as metaphysics. After all, the forces relevant to physics are the forces "by which bodies actually act and are acted on by each other" (*Specimen dynamicum*, GM VI.237/L 437). Yet this problem does not arise once the spontaneity and power as activity theses are kept separate. The point would require further elaboration, but this much seems clear. If these theses are mutually independent, then spontaneity does *not* belong to the essence of primitive force. In that case, the spontaneity thesis no longer poses any problem for viewing physics as operating with the same kind of force as metaphysics—as directly studying aspects or tendencies of life activity, along the lines suggested above.

8. Conclusion

I have argued that understanding the importance Leibniz accords to force requires moving beyond a common picture of powers as dispositions. This involves attending to the traditional constitutive role of powers, obscured by the familiar dispositionalist story of the fate of powers in western philosophy. The need to retain power as the real basis of processes within the new world-view

explains Leibniz's reconception of the nature of power and substance in terms of force or activity. I have also indicated how my reading illuminates the sense in which substances lie beyond the mechanistic corporeal realm—namely as life activities, rather than as minds. As a consequence, the relationship between physical and metaphysical forces also becomes less problematic.

I further hope to have shown that reading past thinkers through the lens of contemporary theories is not the only way to make their views philosophically interesting. Some themes emerging from my attempt at taking Leibniz on his own terms are clearly of continued relevance. The category of activity as an alternative to the standard categorical/dispositional divide merits, I think, further exploration, as does the idea of life as a metaphysical foundation of the *reality* of the universe. More generally, Leibniz's sensitivity to the difficulties involved in reviving Aristotelian metaphysics in a mechanistic context can serve as a healthy contrast to some contemporary neo-Aristotelian approaches—despite significant differences between Leibniz's physical picture and our own, the latter nonetheless inherits crucial aspects of the framework of the new science.[81]

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