

CHAPTER TEN

LEIBNIZ ON FORCE, ACTIVITY, AND PASSIVITY

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Introduction

It is no exaggeration to say that the concept of force (*vis*) was *the* key concept for Gottfried Wilhelm Leibniz (1646–1716), both in metaphysics and in physics. In metaphysics, it is only by conceiving force as the essence of all individual substances that we can, according to Leibniz, understand how there can be created, finite substances at all, dependent upon God—the infinite necessary substance—in some fundamental manner, but at the same time fulfilling the necessary conditions of substancehood—independence, activity, and persistence—and thus truly describable as substances. In physics, it is only by taking force as the basic concept we can derive the correct fundamental laws of motion for bodies. In this chapter, we shall first look at how Leibniz understands his key concept and some of the roles it plays in his thought. This examination will explicate not only how Leibniz’s emphasis on force or power squares well with (and most probably largely stems from) his endorsement of certain central Aristotelian tenets, but also how the concept of force is incorporated into his mature idealist metaphysics. That metaphysics, in turn, generates some thorny problems with regard to the concept of passivity; and so we shall also ask whether and how Leibniz’s monadology, emphasizing the activity as much as it does, is able to encompass the passivity of created substances.

The dynamistic conception of physics

It is well known that Leibniz champions a physical theory he calls ‘dynamics’.¹ But why does the concept of force hold such a preminent

¹ See the beginning of *Specimen Dynamicum*: “Ever since we made mention of

position in his physics? Comparing Leibniz's views to those of Descartes offers an instructive starting point for answering this question. According to Leibniz, the Cartesians endorsed a fundamentally flawed conception of the corporeal nature. We can discern at least two different kinds of argumentative strategies Leibniz adopts to show that Descartes and his followers are mistaken; the first strategy concerns the way in which force is formulated in physics while the second strategy is more philosophical, or metaphysical, in character.

In 1686, Leibniz published a short article in *Acta Eruditorum*, "A Brief Demonstration of a Notable Error of Descartes and Others Concerning a Natural Law",² where he criticized the view of Descartes that the most important conserved quantity in nature is the so-called quantity of motion, a quantity which is proportional to the mass (or volume) and the velocity of bodies. Leibniz argues that the 'motive force' of the body is not the same as its quantity of motion, and that it is the motive force that is conserved. From the point of view of physics, Leibniz's argument against the Cartesians is straightforward. It is plausible to say that in the following two cases,

- (1) body A with mass m falls from height h
- (2) body B with mass $4m$ falls from height $h/4$

the bodies in question acquire the same 'force' in the sense that they are both capable, after the fall, of lifting a mass m to the height h (friction and air resistance ignored). This is because it is natural to say that the task of lifting a body to some height requires the same amount of work (using now only an intuitive notion of work) as does the task of lifting the same body four times to fourth of that height. But this equal force of the two bodies cannot be identified with their quantity of motion (mv) simply because that quantity is not the same in both cases. One needs simply to apply Galileo's formula for accelerating bodies, and the result is that the speed acquired by body A is only twice the speed acquired by B. Thus the quantity of motion of A after the fall is only half of the quantity of motion of B. But if we take the speeds squared, we get a quantity (mv^2) which is the same in both cases. As Leibniz says

establishing a *New Science of Dynamics* [...]” (AG, p. 118). Presumably, Leibniz contrasts his dynamics with kinematics, the study of motion, which does not refer to dynamic concepts.

² L, pp. 296–302.

in *Discourse on Metaphysics*, “[n]othing is simpler than this proof”.³ What is more intriguing is that Leibniz claims that this observation has important consequences for metaphysics, as we will show below.

However, it may be asked, are the two quantities (mv and mv^2) really so different? Leibniz’s own preferred quantity, after all, involves the same simple quantities as Descartes’ quantity of motion, namely mass and speed. It may be that what Leibniz had in mind when he spoke about the metaphysical consequences was not so much the two formulas themselves but the arguments which led to them. In Leibniz’s argument, one important step was to consider the ability to do work acquired by the two bodies. The ability to do something, ability to produce certain effects, was, for Leibniz, the defining characteristic of the concept of force. Thus he can claim to have demonstrated that we must use this concept in our physical explanations of phenomena in order to acquire the right results.⁴

The second line of argument concerns the source of the error made by Descartes and others: it lies, Leibniz thinks, in their geometrization of matter, or the Cartesian view that the essence of matter is extension. Against this, Leibniz holds that the innermost nature of matter is to be conceived as force. In a letter to de Volder dating from 1699, Leibniz presents his reasoning as follows. It is true that material things are necessarily extended, but extension itself can only be understood by reference to the inherent force in bodies, because the concept of extension is analyzable into (“can be resolved into”) the concepts of plurality, continuity, and coexistence, and the concept of something extended presupposes reference to something which is repeated and continued—and this something is force:

So I believe that our thinking is completed and ended in the concept of force rather than in that of extension.⁵

Thus, the idea is that a proper analysis of matter inevitably leads us to the concept of force. But why precisely force and not something else

³ AG, p. 51.

⁴ It is well known that the equation Leibniz proposed for the calculation of the motive force is close to what later came to be known as kinetic energy. Max Jammer’s description is to the point: “Strictly speaking, Leibniz’s concept of force is what we call today kinetic energy, but conceived as inherent in matter and representing the innermost nature of matter” (*Concepts of Force*, p. 158).

⁵ L, p. 516.

that would serve as the underlying basis for repetition and continuation? In his *On Nature Itself* Leibniz elaborates his position:

[T]he very substance of things consists in a force for acting and being acted upon. From this it follows that persisting things cannot be produced if no force lasting through time can be imprinted on them by the divine power. Were that so, it would follow that no created substance, no soul would remain numerically the same, and thus, nothing would be conserved by God[.]⁶

This passage points toward Leibniz's staunch opposition to occasionalism: if things had no proper causal power of their own, even God could not conserve their existence.⁷

To obtain a firmer grasp of what underpins Leibniz's philosophical position, we should be particularly alive to his approval—especially emphatically expressed during his so-called middle period of 1680s and 90s—of the Aristotelian-scholastic doctrine of substantial forms as something we must necessarily posit in order to have a proper philosophical foundation for the world of extended bodies. True to his conciliatory cast of mind, Leibniz was eager to soften the conflict between modern mechanical philosophy and the traditional Aristotelianism, and as part of that project he emphasized the distinction between physics and metaphysics. The concern of the former is the explanation of particular phenomena of nature; one should not rely on any metaphysical principles in explaining these phenomena. Changes in the realm of physical phenomena are determined through efficient causality, and everything is explainable mechanistically by referring only to size, shape, and motion of bodies. In this Leibniz was one of the most consistent followers and developers of the new mechanical physics.⁸ But still, at a more fundamental level, the principles relied on in physics must be based on metaphysical principles:

⁶ AG, pp. 159–160.

⁷ For other reasons for Leibniz to reject occasionalism, see below. Moreover, note that here Leibniz nicely accords with what the Eleatic Stranger of Plato's *Sophist* suggests as the distinguishing mark of real existents; see Pietarinen's contribution on Plato in this volume (pp. 12–13).

⁸ One should perhaps note at this point that this does not mean that Leibniz accepted Newton's physics. Newton's postulation, in the *Philosophiae naturalis principia mathematica* (1687) which Leibniz of course knew, of absolute space and time, and in particular the postulation of the force of gravitation between all the bodies of the universe, was, for Leibniz, unfounded and metaphysically unsound. Leibniz famously criticized many aspects of Newton's thought in his correspondence with Clarke. With regard to the postulation of different kinds of forces in physics, Leibniz's view becomes clear in

[W]e acknowledge that all corporeal phenomena can be derived from efficient and mechanical causes, but we understand that these very mechanical laws as a whole are derived from higher reasons.⁹

Without proper metaphysics we cannot understand the form of the laws of physics, and for Leibniz it was not an option to consider the laws of physics as brute givens, without any deeper explanation. That deeper explanation was to be found, according to Leibniz, in philosophical principles much like to those defended by the Aristotelians. Daniel Garber has argued that not only laws of motion but the unity of bodies as well remains a mystery, in Leibniz's view, without the introduction of substantial forms.¹⁰ The Cartesians held that all bodies, no matter how small, are always further divisible, and as such, Leibniz thinks, they cannot but fall short of being true substances. The following famous passage from his correspondence with Arnauld presents this in a striking fashion:

I think that a slab of marble is perhaps only like a heap of stones, and so could never pass for a single substance, but only for an assemblage of many substances. For imagine there were two stones, for example the diamond of the Grand Duke and that of the Great Mogul. We can use a singly collective noun to do service for both of them, and say that they are a pair of diamonds, although they are a long way apart from one another; but we would not say that they constitute a substance. Now, matters of degree play no part here. If we gradually bring them closer together, therefore, and even bring them into contact, they will not be any more substantially united. And if when they were in contact we joined them to some other body which prevented them from separating—for example, if we mounted them in a single ring—the whole thing would make up only what is called *unum per accidens*. Because it is as if by accident that they are forced to move in unison. I therefore hold that a slab of marble is not a single complete substance, any more than the water in a pond together with all its fish would be, even if all the water and all the fish were frozen together... There is as much difference between a substance and a being of that kind as there is between a man and a group such as a nation, an army, a society, or a college; these are moral beings, in which there is

the following passages: "That physics which explains everything in the nature of body through number, measure, weight, or size, shape and motion, and so teaches that, in physics, everything happens mechanically, that is, intelligibly, [...] this physics seems excessively clear and easy" (AG, p. 312). "It is permissible to recognize magnetic, elastic, and other sorts of forces, but only insofar as we understand that they are not primitive or incapable of being explained, but arise from motions and shapes" (AG, p. 313).

⁹ AG, p. 126.

¹⁰ "Leibniz and the Foundations of Physics", pp. 31–35.

something imaginary, or something which depends on the inventions of our minds. Substantial unity requires a complete indivisible being, which is indestructible by natural means, because its notion contains within itself everything that is ever going to happen to it. Such a thing could never be found in either shape or motion, each of which indeed contains within itself something imaginary, as I have just shown, but *only in a soul or substantial form*, something like what I call myself.¹¹

This long passage contains a wealth of important ideas, but we can highlight the claim that something akin to the substantial form—which was traditionally seen as the feature that, when united with matter, made a complete substance of a certain kind—must be presupposed in order for there to be real bodies in the first place.¹² Moreover, as the end of the passage indicates, it is through the knowledge we have of ourselves that we can gain insight into the unificatory character of these forms.

Still, it may be asked, what does all this have to do with force? The scholastics commonly conceived substantial forms as the loci of activity in things;¹³ as Suárez puts it, “form is essentially act”,¹⁴ “[m]atter is not the principle of any action”.¹⁵ Substances behave in certain characteristic ways in virtue of their forms, or as Suárez suggests, “it is probable that the substantial form has a certain power for having its proper accidents emanate from it”; for instance, water, after having been heated and then left to its own devices, has the power to make itself colder due to its form.¹⁶ In tune with this, the scholastics widely rejected—as we have seen Leibniz doing—occasionalism; as Alfred Freddoso puts it, “[t]he medieval Aristotelians exhibit little patience with those who espouse occasionalism or theories closely resembling it”.¹⁷ That substances are causally efficacious or powerful is something that both scholastic Aristotelians and Leibniz unhesitatingly endorse.

The aforesaid means that the substantial form can be characterized as a kind of power that makes the substance a true unity endowed with efficacy to cause certain kind of effects. It seems to us that this sort of idea underpins Leibniz’s willingness to equate substantial forms with

¹¹ WF, pp. 117–118; the latter emphasis added.

¹² See Garber, “Leibniz and the Foundations of Physics”, p. 32.

¹³ For an instructive discussion of this, see Pasnau, “Form, Substance, and Mechanism”.

¹⁴ *On the Formal Cause of Substance: Metaphysical Disputation XV*, 5.3.

¹⁵ *On Efficient Causality. Metaphysical Disputations 17, 18, and 19*, 18.2.1.

¹⁶ *On Efficient Causality. Metaphysical Disputations 17, 18, and 19*, 18.3.4.

¹⁷ Freddoso, “Medieval Causation and the Case against Secondary Causation in Nature”, p. 99.

metaphysically understood power. The following passage nicely sums up Leibniz's view concerning the topic at hand:

Therefore, I concluded from this that, because we cannot derive all truths concerning corporeal things from logical and geometrical axioms alone, that is, from large and small, whole and part, shape and position, and because we must appeal to other axioms pertaining to cause and effect, action and passion, in terms of which we can explain the order of things, we must admit something metaphysical, something perceptible by the mind alone over and above that which is purely mathematical and subject to the imagination, and we must add to material mass [*massa*] a certain superior and, so to speak, formal principle. *Whether we call this principle form or entelechy or force does not matter, as long as we remember that it can only be explained through the notion of forces.*¹⁸

Thus, the notion of force or power is important both for Leibniz's physics as well as for his metaphysics. The textual source that best explicates how Leibniz saw the relationship between physics, metaphysics, and the notion of force during his middle period is a writing he published in 1695, *Specimen Dynamicum*. According to its whole title, this essay shows the "astonishing laws of nature concerning the forces of bodies and their actions on one another" and traces these laws "to their causes". By 'their causes' Leibniz means the metaphysical underpinnings of the laws of nature. Thus he is here concerned both with physics and metaphysics, although it is the importance of different kinds of forces in physical explanations which obtains most attention. The explicit aim of the essay is to delineate the foundations of a whole new science to which, as we have seen, Leibniz refers as "a new science of dynamics".

Specimen Dynamicum starts with the claim that bodies contain something prior to extension, a force which, as Leibniz emphasizes, is something more than a mere disposition which manifests itself only if the external circumstances are appropriate. The forces placed in bodies by God in creation are instead, says Leibniz, "endowed with *conatus* or *nisus*", their presence leads necessarily to certain outcome if there is no contrary force to thwart this.¹⁹

¹⁸ *Specimen Dynamicum*; AG, p. 125, emphasis added.

¹⁹ AG, p. 118. In a related text (WF, p. 141) Leibniz writes: "This active force is different from a 'faculty' of the Schools, in that a faculty is only a proximate possibility of action, which in itself is dead, so to speak, and inactive unless it is excited by something from outside. But active force involves an 'entelechy', or an activity; it is half-way between a faculty and an action, and contains in itself a certain effort, or *conatus*."

Specimen Dynamicum introduces an all-important crosscutting division of forces: not only can forces be divided into *derivative* and *primitive*, the former usually referring to physical, the latter to meta-physical forces, but also into *active* and *passive* forces. The initial characterization described above, force as something necessarily leading to certain outcomes, seems to capture best the nature of primitive active forces. Active forces are forces by which beings act, passive forces are described as forces “of being acted upon”, and thus they seem to require something else which acts upon the thing having some passive force. In *Specimen Dynamicum*, Leibniz introduces the primitive-derivative distinction by dividing active forces into two kinds. On the one hand there are ‘primitive active forces’ which belong to corporeal substances ‘as such’. On the other hand there are ‘derivative active forces’, which are ‘limitations’ of the primitive forces. Corporeal substances have primitive active forces because they have substantial forms, or souls.²⁰ Because of its substantial form, so Leibniz seems to think, every substance has an inner tendency to change in certain ways. In some texts these primitive forces are also described as ‘primitive motive forces’;²¹ they are the ultimate explanation (apart from God) for the fact that there is activity in the created world, the inner principles of movement of the corporeal substances, of which living organisms seem to be the best candidates.²² The derivative forces are determined as a result of interactions between these living things and their environment. In explaining particular phenomena one should not appeal to primitive active forces, though, but only to the derivative. Later Leibniz describes this by saying that derivative forces are forces “by which bodies actually act on one another or are acted upon by one another”.²³

Next in *Specimen Dynamicum*, Leibniz discusses passive forces which can also be divided into primitive and derivative. Leibniz says that the primitive passive force, which he also describes as the primitive force of resistance, is what the scholastics tried to capture by their term ‘primary matter’. Leibniz elaborates as follows:

²⁰ As we have seen, sometimes Leibniz identifies primitive active forces with these substantial forms, but in this text he says only that primitive forces ‘correspond’ to substantial forms.

²¹ E.g. in *On Nature Itself* 11; G IV, p. 511; AG, p. 162.

²² Often Leibniz endows substantial status only for organisms among the physical things. This view is sometimes described as Leibniz’s panorganicism (see e.g. Rutherford, *Leibniz and the Rational Order of Nature*, chapter 8).

²³ AG, p. 120.

This force is that by virtue of which it happens that a body cannot be penetrated by another body, but presents an obstacle to it, and at the same time is endowed with a certain laziness, so to speak, that is, an opposition to motion, nor, further, does it allow itself to be put into motion without somewhat diminishing the force of the body acting on it.²⁴

Impenetrability and inertia themselves are features of material things, and the primitive passive force is described as something in the nature of substances which explains these features. Primitive forces, both active and passive, belong most fundamentally to substances understood as monads. The monadological theory of substance is not, however, the focus in this text. Instead it is enough for Leibniz to talk as if living things were substances, and primitive forces are considered here as the essential active and passive aspects of these living corporeal things. This affects the way in which Leibniz formulates the primitive-derivative distinction in this text: primitive and derivative forces relate to each other somewhat like general and specific features of things, for example, like the property of having mass in general and the property of having a particular mass. This model seems to work rather well in the case of passive powers, but it does not fit very well with what Leibniz elsewhere says about the primitive active forces, which are supposed to be individual; indeed, they are what individuate the substances, and as such cannot be general.

Forces and monads

In the 1680s and 90s, Leibniz's affinities with the Aristotelian tradition were particularly strong. Garber has argued that during this period Leibniz endorsed a rather hylomorphic view of corporeal substances as entities composed of (substantial) form and (ultimately primary) matter.²⁵ This claim and Leibniz's term of 'corporeal substance' have been the subject of much discussion among his interpreters.²⁶ As already

²⁴ AG, p. 120.

²⁵ "Leibniz and the Foundations of Physics", especially pp. 50–55.

²⁶ Robert Adams (*Leibniz: Determinist, Theist, Idealist*, p. 331) claims that at the end of his middle period, around the year 1700, "Leibniz had nothing nonmental in mind as a model for conceiving of intrinsic or nonrelational properties of substances". Whether Leibniz had another, more Aristotelian, model in mind earlier, as Garber has argued, is another matter. Adams, however, presents arguments against Garber's interpretation elsewhere in his book.

noted, sometimes Leibniz seems to conceive of substances in a way which comes very close to the Aristotelian view according to which living organisms are best examples of individual substances. But it is not easy to reconcile this kind of view with the view which is generally ascribed to Leibniz and which he himself later explicitly accepts, namely the view that individual substances are monads, simple mental entities having only perceptions and appetites as their inner states. Be the exact nature of these matters, however, as it may, here it suffices to note that during this period Leibniz seems, at any rate, to make a closer connection between substantial form and matter than he later does; most importantly for our purposes, this can be seen in the way he sees materiality connected with substances as the source of passivity in things. In several letters, as Garber brings forward,²⁷ Leibniz explicitly claims that matter is the passive principle of substances. Consider the following passages:

However, primitive matter, or matter taken in itself is what we conceive in bodies when we set aside all the principles of unity, that is, it is what is passive, from which arise two qualities: resistance, and tardiness or inertia.²⁸

[T]he mind acts and [...] matter is passive, since in every corporeal substance I conceive two primitive powers, that is the entelechy or primitive active power, [...] which is, in general terms, the substantial form of the ancients, and then the primary matter or primitive passive power which provides resistance. Thus it is properly the entelechy which acts, and the matter which is passive, but the one without the other is not a complete substance.²⁹

In other words, the hylomorphism-echoing doctrine of the middle years offers Leibniz a time-honoured way to account for activity and passivity: the form is the source of activity, matter—whatever its exact ontological status—of passivity. To these correspond two kinds of powers, the aforementioned active and passive powers.

However, as is well known Leibniz moves to a more idealistic position in his so-called mature metaphysics of substance, and this has some important implications for his views on power, activity, and passivity. The outlines of that metaphysics are familiar. The actual world created by God consists of innumerable individual substances, the monads,

²⁷ "Leibniz and the Foundations of Physics", pp. 68–71.

²⁸ G III, p. 260; AG, p. 289.

²⁹ G III, pp. 457–458; translation by D. Garber, in "Leibniz and the Foundations of Physics", pp. 70–71.

which are not themselves extended or material but instead mental in their nature, having perceptions and appetites as their inner states. At the same time these substances can be characterized as ‘corporeal’, for every one of them ‘has’ a body, because to everything in the perceptions of a monad there corresponds something in the state of its body, and vice versa. One way to put this idea is as follows. Every monad has, as it were, two aspects: from one point of view it is a mental existent in the realm of final causes, from another point of view it is a bodily existent in interactions with the other bodies of the universe.

Perhaps the most notorious feature of Leibniz’s metaphysics is the denial of interaction between substances: there is no transeunt causation, i.e. causal occurrences in which two distinct substances are in causal interaction. All activity in Leibniz’s universe, at the metaphysical level, is located strictly inside the monads. To act is, according to Leibniz, “the mark of substances”,³⁰ but substances are active in the sense of containing everything required for their states to follow one another in a series. Every substance has its own series of states, a series of perceptions of the universe from some particular point of view, making it a sort of microcosm reflecting all the other substances in the same world. We shall see that Leibniz had positive reasons for this view of substantial forces, reasons which arise from his theory of substances. But he also had negative reasons. Leibniz became very early in his career convinced that it is impossible to give an account of any causal interaction between substances; in his view there is no metaphysically possible way such an interaction could occur. Leibniz rejects as metaphysically impossible the so-called *influxus* theory according to which something in the substance acting as a cause is transferred into the other—the passive—substance. And no other intelligible model for intersubstantial causality is available either, according to Leibniz. Thus all substances are spontaneous with regard to their own states, but completely causally isolated from other substances.

Looking at what can be considered as Leibniz’s first mature attempt to develop a metaphysics of individual substances, the famous text of 1686, the *Discourse on Metaphysics*, one may wonder whether Leibniz is successful in giving an account of the intrasubstantial causality either. The explicit aim of this text is to develop a view of created substances which would be able to accommodate both the idea that God is the

³⁰ *Specimen Dynamicum*; AG, p. 118.

final cause of everything and the view that there is activity in God's creation. The latter part of the project Leibniz considered as essential to his rationalism: without the possibility of ascribing forces to created things all explanation of natural things would be impossible.³¹ By developing such an account Leibniz hopes to refute the occasionalist view of Malebranche which, as we have seen, he considers as both metaphysically and theologically inadequate. In paragraph 8 of the *Discourse*, which is titled "To Distinguish the Actions of God from Those of Creatures We Explain the Notion of an Individual Substance",³² Leibniz introduces the idea that it is characteristic of individual substances to have "a notion so complete that it is sufficient to contain and to allow us to deduce from it all the predicates of the subject to which this notion is attributed".³³ This idea, usually known as the doctrine of complete individual concepts, does not at first sight appear particularly useful in trying to understand the active nature of individual substances. That Alexander the Great, as an individual substance, has a complete concept which (for God who alone can grasp such an infinitely complex concept) gives, as it were, the complete story of what ever happens to Alexander (a complete blueprint used by God in his creation), does not, it seems, entail the claim that Alexander is something which is himself the sole cause of all of his states. Quite the contrary in fact, one might think: if Alexander is just an instantiation of this complete concept, the metaphysical picture seems quite static, God in his creation fixing or determining his creation in every detail. It can be claimed that the solution to this problem lies readily at hand, however. Alexander instantiates his complete concept at every point of his existence, and for Leibniz this means that there is *now* in Alexander something which makes him such that he, say, conquers some city *tomorrow*. To the real in the individual, which corresponds to the complete concept as a whole, Leibniz variously refers not only by the already encountered notions of *substantial form*, *primitive active force*, and *soul*, but also by the notions of *entelecheia* and *law of the series*.

In his later writings Leibniz rarely refers to complete concepts. Instead, he describes substances directly in dynamic terms, as primitive forces which manifest themselves in a series of perceptions constituting

³¹ In the *On Nature Itself* 6, Leibniz says that in such a case "anything could equally well be said to follow from anything else" (AG, p. 158).

³² AG, p. 40.

³³ AG, p. 41.

the life of a monad. There are two aspects in these primitive forces, aspects which are not quite easily combined into a coherent whole. On the one hand, a primitive force of a substance is something which individuates a substance and ensures its identity over changes. So the primitive force is something which is always the same during the existence of a monad. On the other hand, however, this primitive force manifests itself differently at every moment; it is, as Leibniz sometimes says, “what there is in the present state which carries with it a change in the future”.³⁴ Here meet two requirements Leibniz sets for substances: as we have already seen, they must have intrinsic power in order to persist in existence, and they must be endowed with power to act. The latter requirement leads, in the monadological picture, to the view of substances with power to transfer themselves from one perception to another: without a basic (metaphysical) power, there would be nothing capable of realizing the series of perceptions as stated in the concept of a substance.

In Leibniz’s mind, there is a close connection between the idea that the inner nature of substances is to be understood by referring to the concept of force and the idea, central to monadology, that substances are mental in character. This can be clearly seen by looking at how Leibniz tries to explain the concept to his puzzled correspondent de Volder.³⁵ Having learnt that Leibniz considers forces to constitute the inner nature of substances, de Volder wonders how this is possible, basing his question upon the claim that there is something relational in the concept of force. The puzzle could be formulated as follows: how is it possible for the inner nature of a thing to be constituted by something which essentially involves more than one thing? This kind of relationality seems in particular to belong to the derivative forces. In his reply Leibniz says that he thinks it better “to consider derivative forces in relation to the *foundations*, as a figure in relation to extension, that is, as a modification”.³⁶ As we noted above, Leibniz thinks there could not be derivative forces unless there were some primitive force in the substance itself, of which the derivative forces are only ‘limitations’, somewhat like a particular shape presupposes extension. De Volder’s next complaint, then, is that he cannot, with his feeble intellect, understand what are

³⁴ WF, p. 207.

³⁵ Here we follow closely Adams’s analysis, in *Leibniz: Determinist, Theist, Idealist*, pp. 330f.

³⁶ G II, p. 27; L, p. 537.

these primitive forces which form the inner core of substances. Leibniz assures that it is not difficult at all to understand what primitive forces are: they are simply the inner states of substances which explain the changes substances undergo. De Volder's difficulty, according to Leibniz, is only that he tries to capture primitive forces by his *imagination*. This cannot be done. Leibniz's further attempt to lead his correspondent in the right direction is located in a passage which Robert Adams describes as "one of the most important in all his works".³⁷ In this passage, Leibniz explains the intelligibility of primitive force, or what he describes as a 'principle of action', by saying that

there is something in it analogous to what is in us, namely, perception and appetite. For the nature of things is uniform, and our nature cannot differ infinitely from the other simple substances of which the whole universe consists.³⁸

Deep down everything in the universe is active in the same sense that we are active as thinking and desiring beings, that is, as spirits. For Adams, this is an indication that the theory of substances, with their active intrinsic nature, Leibniz is developing, is basically idealistic in character.³⁹

Activity and passivity in Leibniz's monadology

We have already noted that during the final decades of the seventeenth century, Leibniz conceived passivity in terms of materiality pertaining to things. But this option is no longer open in the new idealistic framework: nothing material can, of course, be contained in monads. As a consequence, Leibniz has to work out a new way of making sense of passivity. Before starting to analyze the conception of activity and passivity in Leibniz's monadology, we may make a preliminary note. Traditionally activity and especially passivity were conceived as something that pertain first and foremost to transeunt causation. This was not so only for Aristotelian thinkers, but also for such a radical spirit as Spinoza, who contends that "we are acted on [*pati*] when something happens in us, or something follows from our nature, of which we are

³⁷ Adams, *Leibniz: Determinist, Theist, Idealist*, p. 331.

³⁸ L, p. 537.

³⁹ Adams, *Leibniz: Determinist, Theist, Idealist*, p. 331.

only a partial cause".⁴⁰ To take another classic early modern thinker, Hobbes seems to have only transeunt causation in mind when he discusses activity and passivity: according to him, no action is "said to be possible for the power of the agent alone",⁴¹ which obviously implies that another substance as a patient is always required for the action to take place. This is in consonance with the standard Aristotelian view according to which, roughly put, a suitable patient is needed for the agent to exercise its causal powers; a fire cannot make anything hot if there is nothing able to receive the heat.

In the mature Leibnizian framework things obviously look quite different from this tradition, and he himself openly acknowledges this:

As I have already said, *anything* which occurs in what is strictly a substance *must be a case of 'action' in the metaphysically rigorous sense of something which occurs in the substance spontaneously, arising out of its own depths*; for no created substance can have an influence upon any other, so that everything comes to a substance from itself (though ultimately from God).⁴²

In other words, there is a very real sense in which all substances are exclusively active: they all cause only changes by themselves (i.e. spontaneously) in themselves (i.e. immanently).⁴³ Where does this leave us with regard to the distinction between activity and passivity? Should it be discarded altogether? No, Leibniz holds, but gives already in the early *Discourse on Metaphysics* indications that it must be conceived in a novel way:

We could therefore say in some way and properly speaking, *though not in accordance with common usage*, that one particular substance never acts upon another particular substance nor is acted upon by it, if we consider that *what happens to each is solely a consequence of its complete idea or notion alone*, since this idea already contains all its predicates or events and expresses the whole universe. In fact, nothing can happen to us except thoughts and perceptions, and all our future thoughts and perceptions are merely consequences, though contingent, of our preceding thoughts and

⁴⁰ E3d2; for the method of reference used here, see p. 215, n. 5.

⁴¹ *De Corpore* 2.10; EW I, p. 129.

⁴² *New Essays on Human Understanding* 2.21.72, emphases added.

⁴³ Cf. Spinoza's definition of activity (E3d2): "I say that we act [*agere*] when something happens, in us or outside us, of which we are the adequate cause, i.e. (by d1), when something in us or outside us follows from our nature, which can be clearly and distinctly understood through it alone." On this definition, it is clear that monads can only be active.

perceptions, in such a way that, if I were capable of considering distinctly everything that happens or appears to me at this time, I could see in it everything that will ever happen or appear to me. This would never fail, and it would happen to me regardless, even if everything outside of me were destroyed, provided there remained only God and me. *But since we attribute what we perceive in a certain way to other things as causes acting on us, we must consider the basis for this judgment and the element of truth there is in it.*⁴⁴

In brief, the challenge is to provide an account of activity and passivity within a philosophical framework which *prima facie* has no room for passivity at all. In what follows, we present Leibniz's response to this challenge.⁴⁵ Given the central Leibnizian doctrine that substances are causally isolated entities—each causing effects according to its own concept alone—, we think it is appropriate to say that the task Leibniz must face is one of giving a *non-causal* account of activity and passivity; and at the first blush this seems to be quite a challenging task indeed.

Already in *Discourse on Metaphysics*, Leibniz makes the connection between activity, passivity, and perfection, and this linkage, in itself wholly in line with the tradition, is further elaborated in his later writings. Broadly speaking, Leibniz quite clearly thinks that it is possible and appropriate to talk about activity and passivity in terms of *changes in the level of perfection* in substances. The following passage from the *New Essays* is especially revealing:

[I]f we take 'action' to be an endeavour towards perfection, and 'passion' to be the opposite, then genuine substances are active only when their perceptions (for I grant perceptions to all of them) are becoming better developed and more distinct, just as they are passive only when their perceptions are becoming more confused. Consequently, in substances which are capable of pleasure and pain every action is a move towards pleasure, every passion a move towards pain. As for motion: it has only phenomenal reality, because it belongs to matter or mass, which is not strictly speaking a substance. Still, there is a semblance of action in motion, as there is a semblance of substance in mass. From that point of view a body can be said to 'act' when there is spontaneity in its change, and to 'undergo passively' when it is pushed or blocked by another body; just

⁴⁴ *Discourse on Metaphysics* 14; AG, p. 47, emphases added.

⁴⁵ It should be noted that we are here not attempting to find out how, exactly, are substances determined to act in the sense of moving from one state to the next the way they do—for an informative discussion of this, see Rutherford, "Leibniz on Spontaneity"—, we will only be focusing on the way in which Leibniz draws the distinction between activity and passivity.

as with the true action or passion of a true substance, we can take to be its 'action', and attribute to the substance itself, any change through which it comes closer to its own perfection; and can take to be its 'passion', and attribute to an outside cause (though not an immediate one), any change in which the reverse happens; because the change can be explained in an intelligible way by reference to the substance itself in the former case and by reference to outer things in the latter.⁴⁶

We can begin by noting that any change towards perfection is an action of a substance, and any change towards imperfection is a passion.⁴⁷ Now, it is far from unprecedented to see a close linkage between activity and perfection, and passivity and imperfection; to cite Spinoza, "[t]he more perfection each thing has, the more it acts and the less it is acted on; and conversely, the more it acts, the more perfect it is".⁴⁸ But there is an element in the above quote from the *New Essays* that surely raises questions: Leibniz claims that actions are such that we should attribute them "to the substance itself", whereas passions are such that they must be attributed "to the outside cause". How does this square with the already noted pivotal thesis that *everything* that happens to a substance is a consequence of its *own* notion, an effect of the *intrinsic* causal efficacy of the substance? Once again we encounter the problem that explaining passivity seems to pose to Leibniz.

The key to the solution of this appears to lie in the qualification located in the parenthesis, that the outside cause is "not an immediate one". The *Monadology* contains passages that seem to explicate the way in which Leibniz reasons about this. In section 50, Leibniz contends that a substance can provide *reasons* for what happens in some other substance or substances; and insofar a substance "provides an *a priori* reason for what happens in the other" it is more perfect than the other,⁴⁹ and, consistently enough, it can be said to act on the other. This, in turn, enables Leibniz to construct a theory concerning the interdependence of monads that does not violate the tenet that there is no causal influence between substances: influence as reason-giving is ideal, and "can only produce its effect through God's intervention, *when in the ideas of God a monad rightly demands that God take it into account in regulating*

⁴⁶ *New Essays on Human Understanding* 2.21.72, emphases added.

⁴⁷ For more on the connection between activity, passivity, perfection, pleasure, and pain in Leibniz's thought, see Kneale, "Leibniz and Spinoza on Activity", pp. 226–233.

⁴⁸ E5p40. For more on activity and perfection, see Roinila, *Leibniz on Rational Decision-Making*, chapter 9.

⁴⁹ AG, p. 219.

the others from the beginning of things".⁵⁰ In other words, actions and passions have to do with God's original creative activity that results in pre-established harmony. Leibniz elaborates:

It is in this way that actions and passions among creatures are mutual. For God, comparing two simple substances, *finds in each reasons that require him to adjust the other to it*; and consequently, what is active in some respects is passive from another point of view: *active* insofar as what is known distinctly in one serves to explain what happens in another; and *passive* insofar as the reason for what happens in one is found in what is known distinctly in another.⁵¹

Moreover,

This interconnection or accommodation of all created things to each other, and each to all the others, brings it about that each simple substance has relations that express all the others[.]⁵²

So actions and passions result when God brings it about that substances are 'accommodated' to each other; and through this, although substances cannot influence each other causally, a substance—to be more exact, we should probably say 'the concept of a substance'—can influence other substances. How should this be understood?

Now, one reading that might be seen as quite readily presenting itself of the passages referring to 'regulation', 'accommodation', and 'adjusting'—for instance of the passage that says "in the ideas of God a monad rightly demands that God take it into account in regulating the others from the beginning of things"⁵³—is as follows: a concept, say C1, can *demand*, or maybe *force* or *incline*, God to modify another concept, say C2, so that C2 becomes compatible with C1. And so we should say that C1 is more perfect than C2, and conclude that C1 is the agent, C2 the patient.

However, when certain Leibnizian key tenets are taken into consideration, it seems quite obvious that this cannot be what Leibniz has here in mind. Now, we take it to be uncontroversial that he holds that substances are individuated completely internally⁵⁴—and then, given a

⁵⁰ *Monadology* 51; AG, p. 219, emphasis added.

⁵¹ *Monadology* 52; AG, pp. 219–220, the first emphasis added.

⁵² *Monadology* 56; AG, p. 220.

⁵³ *Monadology* 51; AG, p. 219.

⁵⁴ See *New Essays on Human Understanding* 2.27.

certain set of individual substances, certain relations hold.⁵⁵ From the viewpoint of the complete concept theory it can be said that “to be a particular individual is to be an instantiation of a particular complete concept”,⁵⁶ so once a certain complete concept is given, we have a specific individual, and it is hard to see how there could be anything left to be ‘adjusted’. In other words, complete concepts are the metaphysical foundation of things,⁵⁷ they make things what they are, and no concept can be modified to any degree without changing it to another concept—and hence to another thing. From this it follows that it is impossible to change a concept to any degree, and so it cannot be so that God tinkers as it were with the concepts of substances to come up with the best of all possible worlds.

How then, given this, should the already mentioned passages be understood? We would like to suggest the following reading of *Monadology* 49–56. The talk about ‘regulation’, ‘accommodation’, and ‘adaptation’ is only a metaphorical way of saying that we are dealing with substances composing a *harmonious* world.⁵⁸ This would not, then, mean that God would somehow modify some concepts according to others, but only that we should restrict our attention to substances belonging to harmonious wholes. Complete concept of a substance is what it is, it cannot be changed to any degree without changing the substance into another substance; but it can be said that some substances, even though completely internally individuated, are in harmony with regard to their inner states.⁵⁹

However, still in need of further clarification is the passage about “*a priori* reason-giving”. Here Leibniz seems to be saying, at the very least, that some substances have what might be called ‘conceptual authority’ over others; and Leibniz obviously wants to explicate this in terms of clarity and distinctness with which something is conceived through a

⁵⁵ See Koistinen and Repo, “Compossibility and Being in the Same World in Leibniz’s *Metaphysics*”, p. 198.

⁵⁶ *Ibid.*, p. 200.

⁵⁷ Thus it can be said, “[e]xistence of several substances in the same world is intuitively a purely external denomination, but for Leibniz it must be based upon the inner states of things; without this foundation there could be no such external relation between the things in question” (*ibid.*, pp. 208–209).

⁵⁸ Cf. a passage in a reply to Bayle, which elaborates this theme: “[E]verything is regulated and *bound together* in such a way that these natural mechanisms which never go wrong [...]” (WF, p. 245, emphasis added).

⁵⁹ Here we are following Koistinen and Repo, “Compossibility and Being in the Same World in Leibniz’s *Metaphysics*”.

concept: something is “*active* insofar as what is known distinctly in one serves to explain what happens in another; and *passive* insofar as the reason for what happens in one is found in what is known distinctly in another”.⁶⁰ It should be noted that this goes well together with the fact that, as we saw above, in *New Essays* (2.21) Leibniz explicates perfection and imperfection in terms of distinctness of perceptions.

When the tenets of harmony and conceptual authority are taken together, Leibniz’s core idea concerning activity and passivity can be interpreted to be as follows. When we are talking about activity and passivity, there is something—say, a change E—with regard to which two substances’—say, X’s and Y’s—internal states are in harmony, and because E is more clearly and distinctly understood through one concept, say of X, than through another, say of Y, this means that X is the agent, Y patient. In other words, the authority one concept can have over another consists of the fact that E can be *better understood* or *seen through*, or perhaps one could say *more easily derived from*, the concept of X than Y.⁶¹ To take the famous example,⁶² if a man hits a dog, the hitting is better understood through the concept of the man than that of the dog; hence the man is the agent, the dog the patient. Moreover and interestingly, Leibniz seems to think that this basic logico-conceptual architecture of the world appears, at the surface phenomenal level, as the more distinct and developed perceptions had by the man and as the more confused and undeveloped perceptions had by the dog.

We can finish by discussing some topics that, if we have interpreted correctly Leibniz’s way of thinking about activity and passivity, may pose problems for him. The example involving the man and the dog contains only two contributing factors, and matters seem relatively clear in that case; but when there are more than two contributing factors—and indeed, there always seem to be, since all monads are interconnected and adapted to each other, each mirroring the whole

⁶⁰ *Monadology* 52; AG, pp. 219–220.

⁶¹ We owe the expression involving derivation to Peter Myrdal. Martha Kneale (“Leibniz and Spinoza on Activity”, p. 232) suggests that in *Monadology* 52 the idea is that when a substance A is active “in an apparent transaction with another substance B”, this means the following: “It is for God to have more regard for A than for B in choosing the order of the universe.”

⁶² A dog is happily eating its meal when a man sneaks up from behind and suddenly hits the dog on the back with a stick; this example was originally put forward by Pierre Bayle in his objections to Leibniz’s metaphysics.

universe—the question is, can Leibniz’s theory give us a clear-cut and convincing way to classify substances into agents and patients?

One approach might be to say that Leibniz’s theory makes activity and passivity matters of degree: any change E can be understood through all the monads, and we can take any two monads and compare the clarity and distinctness with which E can be understood through their concepts, the substance through whose concept E is more adequately represented qualifying as the agent.⁶³ From this it follows that any event has innumerable agents and patients. However, this is probably something that Leibniz would not be willing to endorse; instead, he might want to say that any E has strictly speaking only one substance that can be called the agent—the one through whose concept E can be most clearly and distinctly (or perfectly) understood—while all the other substances are passive with regard to E; and as far as we can see, this kind of position does not go against anything in his system. But putting things in this way may engender some strange results: to take the dog-hitting example, it would seem to mean that both the dog *and for instance we* are patients of the hitting,⁶⁴ and this sounds odd: we would, of course, normally think that only the dog is the patient here.⁶⁵ Moreover, it would seem quite plausible to claim that the hitting is more clearly and distinctly understood through the concept of the dog than through our concepts, which would, surprisingly enough, make us *more of a patient* with regard to the hitting than the dog. Further still, Leibniz’s theory may have an unwelcome corollary: the close connection between activity and perfection leads quite quickly to the idea that the man doing the hitting, assuming that he is the agent, becomes more perfect by hitting the dog. But there may well be ways in which these complexities and questions can be cleared up.⁶⁶

⁶³ See especially *Monadology* 52; AG, pp. 219–220.

⁶⁴ We are grateful to Peter Myrdal for pointing out this problem.

⁶⁵ Perhaps, however, this is not so odd: we are, after all, as helpless bystanders passive with regard to the situation. We owe this point to Olli Koistinen.

⁶⁶ Donald Rutherford (“Leibniz on Spontaneity”, p. 174) presents the following helpful account. When a substance changes according to its own will or desire so that the change is brought about by the substance’s “effort to acquire what it represents as goods”, it is active and exhibits what Rutherford calls ‘agent spontaneity’; when a substance changes so that its states merely represent the physical world irrespective of what “the soul represents as its own volitions”, it is passive, although also this change is spontaneous in the sense of being brought about by the substance itself (and thus each substance always exhibits what Rutherford calls monadic spontaneity). The reason why this account makes Leibniz’s position seem less strange than the preceding

Conclusion

Our discussion has shown, we hope, that Leibniz had several reasons for giving the concept of force a pride of place in his system: not only is a properly understood notion of force indispensable for workable physics, but force or power is also something we must end up with in metaphysics; only by doing so can we fulfil some proper philosophical requirements, having much in common with those addressed by traditional scholastic thought. In Leibniz's monadology, these basic ideas are incorporated to a basically idealistic metaphysics in which there is only one kind of power: the immanent power substances are endowed with to transfer themselves from one state, or perception, to another. This, in turn, requires that we revise our conception passivity; properly understood passivity, for mature Leibniz, is located where his logico-conceptual considerations meet with his dynamic cast of mind: passivity means that a monad exercises its power so that a perception more confused as the preceding one is brought forward—and this happens, as does activity, according to the conceptual architecture of the world, freely chosen by God and realized by his infinite active power in the beginning of times.⁶⁷

discussion may make it appear is that—as Rutherford (*ibid.*) points out—it retains “the commonsense distinction between the soul's activity and passivity: its acting on and being acted on by an external world”.

⁶⁷ We would like to thank Tomas Ekenberg, Olli Koistinen, Peter Myrdal, Juhani Pietarinen, and Markku Roinila for valuable comments on this chapter.