

Emilie du Châtelet's Metaphysics of Substance

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ABSTRACT I argue that Emilie du Châtelet's metaphysics of corporeal substance in the 1740s was a species of realism. This result challenges the ruling consensus, which takes her to have been decisively influenced by Leibniz, an idealist. In addition, I argue that du Châtelet's ontology of body is a mixture of realism and idealism, likewise non-Leibnizian. This, too, questions the scholarly consensus and opens the way for an overdue careful reassessment of her overall doctrine. I suggest that her view is best understood as dualism, a two-substance metaphysics that puts du Châtelet quite close to Christian Wolff.

KEYWORDS Emilie du Châtelet, Christian Wolff, G. W. Leibniz, *Institutions de physique*, substance metaphysics, idealism, monads, Enlightenment philosophy

MUCH EARLY MODERN METAPHYSICS grew with an eye to the new science of its time, but few figures took it as seriously as Emilie du Châtelet. Happily, her oeuvre is now attracting close, renewed attention, and so the time is ripe for looking into her metaphysical foundation for empirical theory (ca. 1740). Accordingly, I move here to do just that. I establish two conclusions. First, du Châtelet's basic metaphysics is a robust realism. Idealist strands, while they exist, are confined to non-basic regimes. Second, her substance realism seems internally coherent, so her foundational project appears successful.

I have two aims in this paper. Historically, I show that du Châtelet's main source of inspiration was Christian Wolff; this goes against the widespread view that her metaphysics comes from Leibniz. Philosophically, I seek to highlight the explanatory power of some modern categories, like 'idealism-' and 'realism about substance.'

To that end, my strategy is two-pronged, apagogic and direct. The former uncovers the vast presence of Wolff's concepts in du Châtelet's ontology, and shows that those notions are at odds with Leibniz's views *as they were known at the time*. The latter examines du Châtelet's metaphysics from within, but by means of our terms. I proceed that way for several reasons. First, 'idealism' is historically sound: her contemporaries used it too, much in the sense that I do. Second, it

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is a historiographic category with *explanatory* and *normative* import, not just a descriptive-sociological label. Specifically, it explains why du Châtelet chose certain principles and doctrinal parts, given her basic commitments about substance; and it helps us diagnose tensions deeply hidden in her system. Third, idealism (and its opposite, realism) is a good heuristic tool, both for uncovering the articulations of her system and for placing it correctly on the map of early-modern metaphysics.

Thus, I begin by raising the question of which eponym best approximates the metaphysics of *Institutions de physique* (section 1). I then move to show conclusively that du Châtelet's metaphysical notions have exact counterparts—conceptual, not just terminological—in Wolff's doctrine (section 2). Next, I explain in detail how the Wolffian ideas she borrowed differ crucially from Leibniz's homonymous terms (section 3). Then I analyze du Châtelet's core concepts directly: I spell out an account of substance idealism (section 4), and two versions of idealism about body (section 5). From them, I infer that she is a substance realist.

I. AN AMBIGUOUS MUSE

I set out by taking du Châtelet at her word, as she deserves. While *Institutions* is a synthesis, she does admit that she had been decisively inspired by some views from Germany. In particular, she allegedly subscribes to the “metaphysics of Mr. Leibniz,” and to “what he calls *Monads*.” However, to present Leibniz's alleged doctrine, she had to rely on Wolffian tracts that “explain with great clarity and eloquence the *system of Mr. Leibniz*, which at Wolff's hands took on a *new form*.”¹ Her admission confounds more than a little. For one, modern readers misled by obsolete historiography might take her to endorse the so-called Leibniz-Wolffian philosophy—especially as she declares, “I shall try to help you understand the ideas of these two great *Philosophers*.”² For another, du Châtelet's phrase, ‘a new form,’ leaves unclear what *she* took the German professor's output to have meant vis-à-vis his predecessor's views. Did she imply that Wolff just re-arranged and spelled Leibnizian ideas into a new presentation while leaving their doctrinal content and inferential connections intact? Or did she mean that Wolff just kept Leibniz's terms while giving them new meanings, even radically so?

Her contemporaries were just as confusing on this count. Henri de Pitot, the *approbateur* for her book, noted pithily that *Institutions* synthesizes Leibniz and Newton. Yet some disciples complained that “Leibniz never composed a Metaphysics,” so “it is *to Mr. Wolff* that she is properly in debt.”³ One thing seems clear: she had studied Wolff's tracts with assiduity, and grasped them impeccably. He attested to that: “I marvel at the clarity with which she expounds even the subtlest things. When she talks about topics in *my* metaphysics it is *as if I can hear myself* teaching in the lecture hall.”⁴

¹Emilie du Châtelet, *Institutions*, 119, emphasis added.

²du Châtelet, *Institutions*, preface.

³Jean des Champs, *Philosophie Wolfienne*, preface.

⁴Heinrich Ostertag, *Briefwechsel Wolff-Manteuffel*, 41.

Ideally, an interpretation of du Châtelet would explain what *she* took the provenance of her foundation to be. But I am not sure that we have enough evidence to gauge precisely her self-understanding of the real origin of key elements. At any rate, even if we did, the interpreter then must ascertain if her statement of purpose matches the outcome. That is, whether the terms 'Leibnizian' or 'Wolffian' are adequate for her metaphysics at all.⁵

For that reason, I have resolved to cut the Gordian knot and ask the latter question directly. Is there a meaningful sense in which du Châtelet's metaphysics is Leibnizian? No, I contend. Rather, among the early moderns, Wolff's doctrine cast the most light on her own system. Names and figures aside, du Châtelet's foundation is a realist metaphysic of substances in transeunt-causal commerce. That puts her views worlds away from Leibniz's monadic idealism, as the early Enlightenment knew it. Sed contra, Wolff's metaphysic and doctrine of body is very close to her own views as of 1740—so close, in fact, that we may use them profitably to clarify du Châtelet's own foundation. Moreover, my results will correct the broad (but mistaken) view among scholars that her metaphysics is Leibnizian or Leibniz-Wolffian.⁶

2. WOLFF IN *INSTITUTIONS DE PHYSIQUE*

Leibniz's metaphysics reached du Châtelet heavily filtered, twice—first by what he chose to reveal to Wolff, then by what Wolff chose to keep from it. She was innocent of this fact, and so she thought she borrowed 'Leibnizian' doctrines, even as she relied on Wolff's heavy tomes for light; but the truth is markedly different. Here I reveal just how little genuinely Leibnizian content survived into du Châtelet's metaphysics—though unbeknownst to her.

Documenting the sheer extent of Wolff's concepts and definitions in du Châtelet's tract will do much for my case. That extent is best shown by a synoptic juxtaposition of the grounding ideas in *Institutions* and their direct sources in his doctrine. As basis, I use Wolff's Latin tracts. They express his considered views, whereas his German works were popularizations; and du Châtelet had studied them too: "she has read my Latin treatises with great diligence," he boasted.⁷

⁵There is a subtle issue here. We ought to distinguish between (1) facts about Leibniz's late metaphysics, (2) what Wolff understood it to be, and (3) how Wolff and his school presented it to educated publics. On (1), trans-Atlantic scholarship agrees that it was monadic idealism; for a French example, see Anne-Lise Rey, "Leibniz et Wolff." (However, some have noted that Leibniz kept making claims compatible with dualism about substance, e.g. Glenn Hartz, *Leibniz*.) As to (2), strong evidence suggests Wolff understood Leibniz to endorse monadic idealism; see below, sect. 3. At the same time, (3) in Germany, Wolff and others advertised Leibniz as a proto-dualist who anticipated Wolff's own dualist ontology. But it was for strategic, not philosophical, reasons. Specifically, the Wolffians sought to deflect accusations—by Lange and Pietist theologians at Halle—of adherence to Leibnizian idealism, which they saw as a form of 'Spinozist' fatalism. For details, see Antonio Lamarra, "Réception de la *Monadologie*," and Jeongwoo Park, "Débat wolffien."

⁶This view is overt or strongly implied in Ira Wade, *Voltaire and Du Châtelet*, 46; William Barber, *Leibniz in France*, 221; Linda Gardiner Janik, "Du Châtelet's *Institutions*"; Robert Walters, "Forces vives et du Châtelet"; Annie Gireau Geneaux, "Du Châtelet entre Leibniz et Newton"; Ruth Hagengruber, *Du Châtelet*, 1–59; Sarah Hutton, "*Institutions* and French Newtonianism" and "du Châtelet and Clarke"; Jean-François Gauvin, "Cabinet de Cirey"; and Paul Moriarty, "The PSR in *Institutions*."

⁷See Heinrich Wuttke, *Wolffs Leben*, 178–79.

2.1. *Framing Concepts*

Du Châtelet's metaphysics rests on an account of being and its kinds. One is "possible being," any entity whose determinations are logically compatible. To exist, or become actual, a possible needs "an external cause." Hence, existence "is the complement of possibility." Next, she notes that "any Being" has both variable and constant determinations. The latter come in two classes: (i) constant determinations, mutually independent and logically compatible; and (ii) those that depend on other determinations for their subsistence. She calls the first class "essentials," and the second "attributes." Essentials are the sufficient reasons of attributes. The former determinations, or modes, are "limitations of the subject" in which they inhere, and vary in that at any time a being may or may not have a certain mode as actual. Non-contradiction with the subject's essentials is the "sufficient reason" for the possibility of modes. Their 'actuality,' however, has a different sufficient reason. Namely, actual modes are grounded either in "antecedent modes" of that being; or in "external Beings"; or partly in the former and partly in the latter. Du Châtelet ends with a definition of substance as "durable, modifiable subject," namely, that which "conserves" and "keeps constant" essentials and attributes as its modes vary and succeed one another.⁸

All these ideas come from Wolff, who had coined 'ontology' to denote his theory of being. He defined 'being' (*ens*) as "that which can exist," namely, "is possible" and "existence does not conflict with it." Its basic determinations are these. (1) *Essentialia*, or mutually compatible yet conceptually independent features, which thus "make up the essence" of that being. (2) "Attributes," which inhere in it always and "are determined by its essentials." (3) Finally, "modes," which are compatible with the two previous classes yet not entailed by them. They are non-constant determinations, in that "at one time [*modo*] they inhere in a being, and at another time they do not."⁹ Essentials contain the "sufficient reason why attributes inhere" in a being, and also why "modes could [*possint*] inhere." But, the reason for modes' *actual* inherence must be sought "either in its antecedent modes; or in another, different being; or in several such beings; or partly in antecedent modes and partly in a different being or beings." Still, "what is possible is not thereby actual." Existence, or actuality, is required "for possibility to be fulfilled [*compleatur*]." Accordingly, he calls existence the "complement of possibility." Since essentials and attributes are constant, while modes are variable and successive, Wolff infers that *something* must endure as their receptive "subject." That is substance, namely, any "perdurable, modifiable subject."¹⁰

2.2. *Substance*

Du Châtelet anchored her view of substance in a theory of "simple Beings," which at times she also calls 'Monads.' They are the alleged "origin" and "sufficient reason" of all that exists in "composite Beings." Because composites act, simples

⁸Du Châtelet, *Institutions*, §§ 39–44, 52.

⁹Christian Wolff, *Cosmologia*, §§ 134–35, 143–51.

¹⁰Wolff, *Ontologia*, §§ 157–60, 170–75.

must “contain a principle of action,” namely, “force.” It is a “continual tendency to act,” and it “always has its effect if no sufficient reason impedes it” from acting, that is, “when there is no resistance.” From the common experience of constant universal change, she infers that every *simple* being is “by its internal force, in a motion that produces in it constant change.” Likewise, simple beings are “durable and subject to modifications” produced by that force. No “natural agent” can arrest it, so simples are indestructible, thus “are true substances,” as they meet the two criteria for substancehood, namely, perdurability and modifiability.¹¹

Wolff is again the source of these ideas. In his doctrine, a state is a “determination of mutables coexisting with the fixed,” that is, a being’s combination of essentials, attributes, and particular modes. As only the latter can vary, a change of state (*mutatio*) occurs when its modes “do not remain the same.”¹² A change of state is an “action,” and if substances change states, “necessarily they must be endowed with force.” Force “contains in itself the sufficient reason of an action,” so if a force exists, “action always follows, unless the force is resisted.” Resistance is “any impediment to action,” or change of state.¹³ Insofar as beings change, Wolff’s rationalism entails that force, action and resistance are features of *any* change.

Wolff privileged a species of metaphysical simples, namely, “elements.” They are the “irresolvable, or first, internal principle of bodies.” Being partless, elements lack size, shape, *internal* motion and structure.¹⁴ Bodies “arise” (*oritur*) from them, hence elements are the true “atoms of nature.” In them “are contained the ultimate reasons” of all that “belongs to body considered in general,” so they must have all the features needed to explain all corporeal makeup and processes. Accordingly, elements have “force,” whereby they “changes states,” internal or external, and “suffer” (*patiuntur*) by one another. So, they must be “endowed with an active and a passive principle.”¹⁵ The internal state of all elements “changes continually,” ergo they have variable modes.¹⁶ Driving these changes is “force, which nothing resists” in elements. Force—and a “passive power,” needed to explain passive changes in *bodies*—are constant determinations. Elements thus are the “perdurable, modifiable subjects” of these modes. Ergo, by Wolff’s criteria they count as true substances.¹⁷

Du Châtelet, moreover, asserts that a simple being has states, which “depend on one another,” each on its predecessor, as the sufficient reason for why *this* state is “actual, and why at this time” rather than another. And so on, all the way to the being’s first state, which “depended on God” alone. Moreover, “everything is connected” in the world: each being has a relation (*rapport*) to every other,

¹¹Du Châtelet, *Institutions*, 125–27.

¹²Wolff, *Ontologia*, §§ 705–6. His ontology admits two kinds of modes of beings, even of simple beings, i.e. of monads: internal *and* external. The former are “intrinsic mutables,” the latter “external relations” (*Ontologia*, § 710). And, Wolff gives no indication that external modes are reducible to internal, or intrinsic ones. This is critically important to his position vis-à-vis Leibniz; see sect. 3.

¹³Wolff, *Ontologia*, §§ 722, 726–29.

¹⁴Wolff does not rule out that they may move relative *to each other*, and du Châtelet in fact goes on to assume that they do (*Institutions*, 125–27).

¹⁵See Wolff, *Cosmologia*, §§ 191, 196, 207, 294.

¹⁶Wolff confesses that we have no determinate knowledge of these elemental modes, being as yet unable to describe exactly the specific nature of their active force (*Cosmologia*, § 206).

¹⁷Wolff, *Ontologia*, §§ 768–70.

coexistent, preceding or successive. So, the universe “is a whole,” one “single machine” whose parts “relate to one another” and are so connected as to “conspire toward a single end.” Connections (*liaisons*) between elements are the “ultimate reasons” for inter-body connections. Hence, “every Element has a relation [*relation*] to the present state of the whole Universe” and to its past or future states.¹⁸

Wolff had made these points too. For him, the Principle of Sufficient Reason (henceforth, PSR) entails that any two elements “are dissimilar.” The ground of their unlikeness must be some difference in their respective “intrinsic states,” then. Elements’ internal states “changes continually,” and each state changes “by some law whereby [*ea lege ut*] the present state contains the reason for the next.” Also, each element “contains a series of changes” different from that of any other. Single states in an element “depend on each other for their existence,” hence from a present state one can gather (*colligi*) what the next and the previous state is. Likewise, “all elements are connected to each other” such that each one’s state “involves a relation to other coexistents,” and for any change in one “a reason can be given from changes in others.” Indeed, “all elemental changes” are interconnected universally. In fact, every state and change are also related “to all composites, coexistent with it and succeeding it too.” Connected to each other and to their composites, namely, bodies, the “state of any element involves some relation to the entire universe,” *mundum integrum*, such that from the state of one we may “gather for all time which was the state” of any other element, body, or the world.¹⁹

2.3. *Doctrine of Body*

Du Châtelet’s key premise is that body is a composite; hence, the “properties of a composite Being” apply to it.²⁰ No change occurs in composites except “in respect to shape, size, the relative situation of its parts, and the place of the whole.” So, she infers, no corporeal change “can be made without motion.” Composites are supposedly extended, so bodies must be too. Still, we must add to extension “the power to act.” Consequently, “force, the principle of action, is spread throughout Matter, which could not be without *motive* force.” In addition, “resistance, or *passive* force,” is also essential to body. This is showed by reason, for without this passive “force of inertia” the laws of motion “could not subsist,” since motion “would be without a sufficient reason.” Extension “combined with the force of inertia is what they call *Matter*,” but its idea so conceived is incomplete, she posits. We must add to it “motive force,” which “contains the sufficient reason for the actuality” of change. Ergo, “all changes occurring in Bodies” can be explained “from these three principles: *extension*, *resisting* force, and *active* force.” These principles “do not depend on one another.” Neither force entails the other, nor is it the “origin of the property of extension.”²¹

¹⁸Du Châtelet, *Institutions*, 129–30.

¹⁹See Wolff, *Cosmologia*, §§ 195, 197–200, 204–10, 213–14.

²⁰However, du Châtelet does *not* have a theory of ‘composite being.’ Wolff does—it is the second half of his *Ontologia*—and so presumably she expects the reader to rely on his results there in order to grasp her theses on body as composite.

²¹Du Châtelet, *Institutions*, §§ 140–42, 143–47.

This, too, is a statement of Wolff's doctrine, which had he rested on two pillars. One is his theory of composites—specifically, an application to “the world, or universe,” of results and principles “demonstrated in *Ontologia* in respect to being in general, and *composite* being in particular.” The other was a doctrine of *nexus*, a relation-genus of mutual interdependence holding between all “things” (*res*) as proper parts of the actual world. “We call connected to one another [*inter se*] those beings of which one is the sufficient reason for the coexistence or succession of the other.” Things thus connected “*depend* on each other as to their existence.”²² Wolffian bodies have three essentials, or constant and mutually-independent determinations. The first is extension. Bodies are composites, and a composite of beings “existing *extra se* and united” must be extended, hence so must bodies. The second is the “force of inertia, or passive Force,” a principle of “resistance to motion” and also “to all change.” The third is “active force,” as the “principle of changes.” This “force of acting” inheres in moving bodies, and so he calls it *vis motrix* (motive force). Then, from his ontology, he takes that “in a composite, no change can occur save by motion.” Applied to bodies, it allegedly entails that all change in a body always is or reduces to change “in respect to its shape, size, situation of the parts, and the place of the whole.” Ergo, a body is “a machine,” he infers.²³

Du Châtelet, too, claims that active force is independent of extension and force of inertia, so “we must represent it as a separate Being, enduring and subsisting on its own.” And, “it has Modes,” namely, “speed, which determines its internal state,” and “direction, corresponding to its external state.” Endurable and endowed with variable modes, active force “must therefore appear as a substance.” The same goes for matter: we must conceive it as a “durable, modifiable subject,” hence “like a [*comme une*] substance,” though it is not really one, as it “draws its substantiality” from the elements that ground it. More generally, though matter and active force “appear to us as substances,” they are really “just Phenomena,” in the technical sense of “*images or appearances arising from several realities by confusion*,” she explains.²⁴ Appealing to Wolff, she describes extension, force of inertia, and active force as “substantiated phenomena,” a term she explains as he did.²⁵

Wolff had made these points before her. Allegedly, the force of inertia “is not determined through extension,” and “neither is the active force” of bodies. Nor is extension, which is grounded merely in the “positing of a manifold of distinct coexistents,” not in any type of force. Further, active force has two modes: “speed” (*celeritas*) and “direction.” The former determines the force’s “internal state and the latter its “external” state. Wolff then calls “matter” the combination of “extension endowed with force of inertia.” So, a body is matter endowed with active force. These two features are mutually independent, hence must be thought of “as

²²Wolff, *Cosmologia*, §§ 6, 10, 14, emphasis added.

²³See Wolff, *Ontologia* §§ 540, 619, 647; and *Cosmologia* §§ 120, 127, 130–31, 135–37, 221.

²⁴Du Châtelet, *Institutions*, §§ 150–54.

²⁵She means ‘substantiated’ as *substance-like*, viz. enduring and modifiable, or endowed with variable modes; and ‘phenomena’ as confusedly *perceived*—though by our senses only, *not* by every other monad. And, they are *substance-like* in that they are not true substances. Rather, they each are grounded in facts about elements, viz. *their* aggregation, passive, and active force, which ground corporeal extension, inertia and motive force, respectively.

distinct subjects,” for each is “perdurable” and “modifiable” on its own. Because of that, “we must conceive” of both matter and active force “as substances,” *instar substantiae*, although they really are just “phenomena,” in that “we perceive them but confusedly [*nisi confuse*]” and for that reason “they appear as substances.”²⁶ In sum, the key concepts and theses in du Châtelet’s foundations of science come from Wolff, despite her invocations of Leibniz.

Objection: This proves nothing; perhaps du Châtelet honestly thought that all she took from Wolff comes from Leibniz. Answer: that is possible. Much of Leibniz’s considered views remained unpublished at least until the 1765 Dutens edition of his works. Still, the crucial question remains. Are her foundations *really* Leibnizian? They are not, I submit. Wolff and Leibniz differ radically on basic issues in metaphysics and natural philosophy. I move to show that now.

3. WOLFF AND LEIBNIZ

The Leibniz that Wolff knew—the one that revealed himself to Wolff—was a monadic idealist about basic substance. The revelation (really, an invitation to idealism) occurred around 1705, in correspondence ostensibly about the metaphysical basis of Leibnizian dynamics, which Wolff then strove to understand. It is from this idealist metaphysician that Wolff distanced himself—in private and in writing—out of a mix of ambition, prudence, and a certain failure to comprehend exactly what monadic grounding amounted to. Leibniz’s philosophy “begins where mine ends,” Wolff had declared, irritated by the suggestion of a ‘Leibniz-Wolffian’ philosophy.²⁷ He did not exaggerate—they differ radically. In his mature years, Wolff was not an idealist about substance; and he was a realist about inter-substance relations. A host of momentous differences follow from this dual rift between them.²⁸

3.1. Substance

Their deepest difference is in metaphysics. Both agree that basic substance must be simple, or partless. Leibniz, at least in later years, believed that true substances are *all* mind-like, or endowed with powers of representation analogous to perception and desire. Any genuine substance must be “what I usually call a *monad*, in which there is something like perception and appetite,” he had said in 1698 publicly.²⁹ In letters, he had offered that view to Wolff too, who demurred. After Leibniz died, Wolff confessed that he found Leibnizian monads “a riddle.” As a result, for decades he professed agnosticism about the attribute of basic substance. He argues

²⁶See in order Wolff, *Cosmologia* §§ 152–54, 164–65, 295–301, 178.

²⁷Wuttke, *Wolffs Leben*, 82–83.

²⁸A clear and forceful case is Donald Rutherford, “Leibniz and Wolff.” More evidence that Wolff was *not* an idealist about substance is in Desmond Hogan, “Wolff on Order,” and Eric Watkins, “Leibniz und Wolff.” Cf. also Sonia Carboncini, “Wolff e Leibniz,” which argues that Wolff had seen the *Monadologie* as early as 1709, over a decade before it appeared in print. An account of Leibniz’s attempted conversion of Wolff is Anne-Lise Rey, “Leibniz et Wolff.”

²⁹G. W. Leibniz, *Essays*, 162–63.

that it is a force (*vis*), and yet he cannot say anything definite about it, and so he “shall leave it to further investigation,” he resolves.³⁰ Then he adds that he “cannot yet see any necessity that *all* simple things must have the *same* kind [*einerley Art*] of force,” which Leibnizian monads famously do. In fact, ‘elements’—the Wolffian metaphysical simples that make up bodies by aggregation—must have the kind of force “from which the force of bodies . . . can be derived *intelligibly*,” he decides in an explanatory follow-up to his *German Metaphysics*; and Leibnizian monads are *not* that intelligible foundation. And by 1731, Wolff will have made up his mind that his elements are *not* endowed with mentalistic powers, so he calls them “physical monads” to signal that their ‘force’ is not a *mental* power to represent.³¹ This marks his radical difference from Leibniz: in Wolff’s metaphysics, substance comes in two kinds. One is mind, or mind-like simples endowed with a *vis repraesentativa*. The other is “elements of bodies,” simples equipped with (indeterminate) active and passive forces that underpin *physical* forces of motion and resistance to it. Wolff regards elements qua non-mentalistic “atoms of nature—physical points, one might call them,” as he explains.³² He never ascribed perception to elements.

Significantly, this radical difference between them was public, and advertised early by Thümmig, Wolff’s first disciple and author of a ‘sixth letter’ to Clarke. In a compendium of Wolffian doctrine, he explained:

To the elements of material things, Leibniz ascribed a force to perceive [*vis percipiendi*] fully on a par with [*perinde ac*] the force of his simple substances. By that force, the elements *represent* the universe, even as they are barely aware [*minime conscia*] of what they represent. And, Leibniz called all simple substances by the name of Monads. Still, his doing so failed to make clear how the moving force of composites derives from the elements of material things. For that reason, our Philosopher [viz. Christian Wolff] *did not subscribe* to Leibniz’s views. (Ludwig Thümmig, *Institutiones Wolfianae*, 107, emphasis added)

His compendium was a best seller in Germany and influential abroad. Anyone who cared to look would have learned without effort of the metaphysical gulf between Leibniz and Wolff.

A corollary of this gulf becomes crucial for classifying du Châtelet’s own metaphysics. They also diverge radically on the nature of ‘forces’ exerted by substances. Leibniz-monadic forces have *mentalia* as features; they are all powers to represent, and they differ just in degree of clearly and distinctly grasping the same mental content. In sharp contrast, Wolff-elemental forces are measurable quantities; they differ in ratio, not in semantic content. Consider Wolff’s theses on simple beings, which include elements, that is, the substances grounding body: “Forces have a quantity, or magnitude. . . . Forces can be expressed by means of straight lines, and their relations exhibited through those of the straight lines whereby we determine curves. . . . Actions and forces can be measured, and their quantities explicated clearly through numbers. . . . Mathematical knowledge of forces is possible.”³³

³⁰See Wolff, *German Metaphysics*, § 598; for a lucid analysis, see Watkins, “Nature of Simples,” 281–86.

³¹See in order Wolff, § 369, and *Cosmologia*, § 187, emphasis added.

³²Wolff, *Cosmologia*, § 216.

³³Wolff, *Ontologia*, §§ 739–42.

Thus, in the end, Wolff was quite right to call his basic substances ‘elements’ so as to signal his distance from Leibniz. At times, du Châtelet names her substances ‘monads,’ but she calls them ‘elements’ much more often. In sum, there is hardly anything to learn about du Châtelet’s metaphysics by turning to Leibniz for light; Wolff alone is of help in this matter.

3.2. *Relations*

Leibniz famously held that monads were ‘windowless,’ that is, causally inert in regard to one another. In the monad, all change—of *representational* state, to be sure—is self-caused, and unfolds according to its “complete concept,” thus monadic action is always immanent self-action. Divine wisdom ensures, by pre-established harmony, that self-change is coordinated across monads: there is a common semantic content to their ‘perceptions,’ and *its* changes are law-like. Leibniz’s denial of transeunt causation extended all the way to bodies. Their change of state is also self-caused, yet globally coordinated by a pre-established harmony of bodies.³⁴

And, Leibniz had shared these views with Wolff, precisely in response to the latter asking him, in 1705, how he ought to understand inter-body causation. To Leibniz’s reply that there is none, Wolff responded, “I like the system of pre-established Harmony a great deal.”³⁵ And yet, in the end, his considered view was *realism* about transeunt causation, the exact opposite of Leibnizian doctrine. This is apparent from two sources. In his general theory of simple substances, Wolff is explicit that they act—and are acted—on one another. Consider his assertions in *Ontologia*: a thing’s “*external* state changes if its relations to *other* things do not remain the same”; “a *Passion* is a change of state whose reason is contained outside the subject that changes state”; “a *Patient* is the subject of a passion, hence it is the being in which a passion is actual”; “if [a substance] A suffers on account of [a substance] B, then B *acts on A*.”³⁶ So, the patient, “insofar as it suffers, depends on *another*.” A principle “is *external* if it exists outside the principiated,” a cause is a principle “on which depends the existence (actuality) of *another* being distinct from it,” and a cause “is *external* if it is an external principle.” The caused “depends on its efficient cause, and is called an *effect*; so an effect is a being, the reason for whose existence (actuality) is the action of *another* being.”³⁷

Second, they stand apart on metaphysical relations in general, not just causation. By 1710, as Wolff came to see that Leibniz had become a monadic idealist, he could easily grasp that monads have *no* direct relations at all. They have “no real order which reaches beyond the order of phenomena. Each is as it were a separate world,” as Leibniz had said.³⁸ That is, monads have only second-order relations defined wholly “on their *perceptions* of a common, spatio-temporal” world.³⁹ Since Wolff’s

³⁴I follow here Gregory Brown, who argues persuasively that Leibnizian bodies do *not* interact; see his “Harmony of Aggregates.”

³⁵Carl Immanuel Gerhardt, *Briefwechsel*, 46.

³⁶Cf. in order Wolff, *Ontologia*, §§ 706–7, 714, 720, 729, 775.

³⁷Wolff, *Ontologia*, §§ 853, 870, 881–82.

³⁸Leibniz, *Papers*, 602.

³⁹Rutherford, “Phenomenalism and Reality of Body,” 24, emphasis added.

elements—the metaphysical ground of bodies—are not mind-like simples, his view of substantial relations must perforce be different. And indeed, elements stand in a manifold array of relations to each other, *direct and real*, not phenomenal. One is 'external to each other,' a 2-place ordering relation that grounds extension in bodies.⁴⁰ More broadly, his substances stand in a real *nexus elementorum*, a relation-genus with externality, succession and causation as species:

All the elements of material things are connected to each other. . . . The state of every element involves a relation to other, coexistent elements. . . . The elements suffer [*patiuntur*] by each other. . . . The changes in all elements are connected among themselves. The elements are united among themselves [*inter se*]. There is in elements an active and a passive principle. (Wolff, *Cosmologia*, §§ 204, 206, 210, 220, 294)

Moreover, this web of inter-substance relations grounds the nexus of (spatio-temporal and causal) relations holding bodies together into the actual world: "The nexus of material things depends on the elements' nexus. Every body is changed by another. All things in the world depend on one another."⁴¹ This could not be any further from Leibniz.

Though unobvious, their deep divergence so far has capillary ramifications.⁴² There is no doctrine of pre-established harmony in Wolff's metaphysics, whether of elements or of bodies.⁴³ Neither does he have a notion of monadic expression, for his elements are not mind-like. Leibniz's principle of individuation for substance is the complete concept of that monad. For Wolff, it is active force. Even more significantly, one tries to account for space and time in a way that the other, a better philosopher, does not. Wolff sought to ground space—or rather, extension with its attributes—in facts about *direct* inter-monadic relations of externality. Leibniz never took this route. His space was an order of "possible situations" for coexistent *intentional* objects as perceivable by all monads.⁴⁴

3.3. *Body*

Leibniz had used his insight into the nature of body to rebuff both Descartes and Newton. In the *Brevis demonstratio* of 1686, he had argued that corporeal nature cannot be just extension, as the Cartesians had it. Rather, force is essential to it. This may mislead us into supposing that he took body to be extension *and* force. In fact, his view was more radical. By its nature, a body is just force, active

⁴⁰See Wolff, *Ontologia*, § 161, and *Cosmologia*, §§ 219, 221: "The elements of material things exist outside each other. Aggregates of elements are extended." For sharp analyses, see Rutherford, "Leibniz and Wolff," 232–35; Watkins, "Nature of Simples," 283–90; and Hogan, "Wolff on Order."

⁴¹Cf. Wolff, *Cosmologia*, §§ 205, 139, 58; 54–57.

⁴²Watkins helpfully spells out some of these differences, in "Nature of Simples," 280–90.

⁴³Still, Wolff did have a notion of pre-established harmony between mind and body. Even that, however, becomes peripheral and non-committal in his Latin treatises; cf. Watkins, "Leibniz's Reception." Hogan notes insightfully that, given Wolff's rejection of Leibnizian idealism, whatever he meant by 'general harmony' in the *German Metaphysics* cannot possibly have been the *representational* harmony of Leibnizian monads (Hogan, "Wolff on Order," 39).

⁴⁴Admittedly, this is a crude simplification of Leibniz's sophisticated views. I use it just to highlight the radical difference between him and Wolff on this topic and—by implication—between him and du Châtelet, who followed Wolff.

and passive. Corporeal extension is a secondary, derivative property. Namely, it is entirely explainable from—thus reducible to—a body’s force spreading itself over a volume, which it thus renders impenetrable, and so it makes it *that* body’s extension. Therefore, extension

expresses nothing but a certain non-successive yet simultaneous diffusion or repetition of some particular nature. But this nature which is said to be diffused, repeated, and continued is that which constitutes a physical body, and it can be found in no other principle but that of acting and suffering. (Leibniz, *Papers*, 536, translation modified)

Then, around 1702, in an unpublished fragment known as *On Body and Force, against the Cartesians*, he explained that “extension is not an absolute predicate, but is relative to that which is extended or diffused,” namely, “the *dynamicon*, or the innate principle of change and persistence.”⁴⁵ Wolff differs crucially on this point. For him, extension is *co-basic* with force, and irreducible to it. He takes the nature of body to be three independent determinations: extension, active force, and passive force. And he makes clear that extension is fundamental, not derivative.

Matter is extension endowed with force of inertia. . . . All corporeal change can be explained by extension, force of inertia, and active force. . . . Extension does not determine the force of inertia. Rather, [that force] is presupposed in extension. . . . The force of inertia need be admitted in the notion of body *only* insofar as the *communication of motion* [in collisions] must have a sufficient reason. (Wolff, *Cosmologia*, §§ 141, 131, 129)

To sum up contrastively, the Wolffian body is extension endowed with force, while for Leibniz it is *just* force.

3.4. Dynamics

Wolff diverged from Leibniz in natural philosophy as well. True, in the mid-1720s he had militated for Leibnizian mv^2 as the right measure of the ‘force’ of a moving body. And yet, in his considered doctrine, Wolff relegates it—together with Conservation of Vis Viva, its governing law—to the periphery of his foundations, where it holds just for elastic collisions, not to mechanical processes in general.⁴⁶ The basic law in Wolff’s metaphysical dynamics is the Equality of Action and Reaction. This was a sharp departure from Leibniz, who had posited Conservation of Vis Viva as *the* law of all dynamics.

Another difference is subtle but deep. Leibniz’s commitment to the pre-established harmony of *bodies* entails that his ‘force of inertia’ and ‘active force’ cannot possibly be forces of interaction, for that is two-way transeunt causation, which he rejects. So, Leibnizian inertia measures a body’s resistance to *self*-action. And his active force is properly a body’s endeavor to overcome *its* own inertia, and change to a new state. Leibniz’s talk of interactions is just his irenic sop to common usage, *salva veritate*. It is not literal. Whereas Wolff does say, and means it, that his *vis inertiae* is an outward-directed force of resistance to *other* bodies seeking to change a body’s state of rest or motion. Likewise, his *vis motrix* is a body’s endeavor to act

⁴⁵Leibniz, *Essays*, 251.

⁴⁶The theory is expounded in Wolff, *Cosmologia*, §§ 445–90.

on other bodies that prevent it from continuing in uniform translation.⁴⁷ Wolff's dynamics is a theory of interactions, not of harmonious self-action as Leibniz's is. Lastly, they had different views on the paradigm process too. For Leibniz, the epitome of dynamics was elastic collision, because *vis viva* is demonstrably conserved in it. For Wolff, it was inelastic impact, as it made plain that physical action is a contest of forces (active vs. passive) between bodies.

These accumulated facts alter essentially our image of du Châtelet's foundations. Her basic substances are 'elements' equipped with physical forces, not mind-like unities endowed with analogues of perception. It is these forces that distinguish her elements from each other, not their respective complete concepts. They stand in real, direct relations, not insulated yet in pre-established harmony. For her, space and time are grounded in real relations between elements, not just abstractions from common perceptions by all basic substances. Her bodies are real aggregates exerting transeunt causation, not windowless intentional objects engaged in self-action. They are extended by their nature, not derivatively, and her basic dynamical laws come from Wolff. In fact, hardly anything about her metaphysics is genuinely Leibnizian, apart from the meager requirement that substance be simple, or incomposite. And so, the received consensus on du Châtelet's metaphysics appears wholly untenable.

4. IDEALISM: SUBSTANCE

So far, I have identified du Châtelet's metaphysics indirectly, by triangulating its position from two distinct landmarks, Leibniz and Wolff. Now I move to characterize it head-on, by asking whether it is a system of idealism, a type of realism, or some hybrid *sui generis*. I ask that question at two levels, namely, in regard to substance and to body; many early moderns kept those two in distinct realms, and du Châtelet is no exception.

First, I must clear up and justify my notion of idealism. There are two idealist strands in early modern metaphysics. (i) Taking the mind-dependence *relation* to be basic and required for grounding higher ontological regimes. This strand will guide my investigation of du Châtelet's doctrine of body, below. However, decisive for her substance metaphysics is (ii) positing minds like ours to be the sole ultimate *entities*.⁴⁸ My two construals above are based in eighteenth-century accounts of idealism:

the *Idealists*, who deny the world's real actuality outside the soul . . . (Wolff, *German Metaphysics*, 436)

Idealists are called those who claim bodies to have only an ideal existence in our souls. Hence they deny the existence of a real world and real bodies. . . . Idealists admit solely the soul's existence, whereas they relegate all bodies to the realm of ideas. Therefore, the Idealists are Monists who claim the soul to be an immaterial being. (Wolff, *Psychologia*, 25).

⁴⁷Wolff, *Cosmologia*, §§ 136, 149.

⁴⁸Of course, the phrase 'like ours' does explanatory work, and would need careful explication. As we unpack it we might discover irreconcilable differences between the early moderns who subscribed to it. In this paper, I use 'like ours' in the weakest sense, viz. that *belief* best describes the "principal attribute" of such entities; or that *all* their states have (narrow) mental content.

In regard to the doctrine of the substances making up this world, . . . *Monists* are those who admit just one kind of substance to exist. [Among them], there are those who take this single kind to be human souls and other perceiving substances [*adperceptivas*]. Hence these philosophers grant to bodies merely an ideal existence in our souls. So, they deny the corporeal world has a real existence, and thus we call them *Idealists*. (Reusch, *Systema metaphysicum*, 586)

There have been philosophers who held that apart from spirits there are no other substances in the world. They asserted that all other things we represent as outside of us and real—the sun, moon and stars, and all the like things we call bodies—are nothing else but ideas or representations in our mind [*Verstand*]. Hence we call them *Idealists*. (Meier, *Metaphysik*, 161)

Further, strand (ii) above yields two working definitions for my problem:

s-idealism: All substances are minds or analogues of minds. Their existence is genuine and basic. Everything else has ‘derivative’ existence, qua intentional objects of mental representations.

s-realism: The negation of the above. Hence, at least some substances are non-mental. Their acts and states have no intentional content.

I claim her view of substance is s-realism as defined above. Now I prove it.

Substance idealism is a complex thesis, and it comes in several flavors. I propose below three tests, of increasing strength, to decide if the metaphysics of *Institutions* counts as idealist. The tests are based on motivations for idealism operative in Continental rationalism from Leibniz to Kant. These motivations, in turn, follow from the Leibniz-Arnauld thesis that unity (meant as absence of parts) is the key feature of genuine substancehood.

1. A negative test: the denial that substance has any traits essential to mechanistic bodies: size, shape, internal structure, and motion.
2. Using ‘force’ improperly, to denote a substantial power to *represent*.
3. A dual test. (a) The denial of *inter*-substance transeunt causation. That entails (b) perception ought to be a key trait of elements. More generally, elements should have intentional states with semantic content.

Note that the first test is the weakest, and the third the strongest. Now let us apply them consecutively to *Institutions*.

Du Châtelet very clearly passes the first test. In her own words, “Not having parts, simple Beings are indivisible; . . . have no shape, . . . no size, and fill no space; and have no internal motion.”⁴⁹ So, her elements have no corporeal *essentialia*. Still, this fact is too weak to support a verdict of idealism, and here is why. In her time, there was a type of substance with all the (non-corporeal) traits above, and yet it was *not* mind-like. Between 1720 and 1760, no less than three figures argued for some species of this substance, namely Wolff, the pre-critical Kant, and Boscovich. They agreed that basic substance (really, one kind of it) is point-sized, not extended; and is endowed with physical force, be it a motive force or of resisting changes

⁴⁹Du Châtelet, *Institutions*, 122–23.

in motion. For this metaphysically simple object, Wolff and Kant coined the term “physical monad.” Boscovich called it “physical point.” To sum up: there are *realist* metaphysics that pass the test (1) for substance, and du Châtelet’s own doctrine is very much like them.⁵⁰ So, it is unlikely she was an s-idealist.

Now for test (2). At the outset, a justification: I based the test on the claim that it is improper to use ‘force’ to denote mental powers. Thanks to Newton, Jakob Hermann, and Euler, by 1740 the unqualified term ‘force’ had become entrenched as a name for *physical* agency associated with motion. In contrast, for mentalistic contexts the term was always qualified as ‘force of representing.’⁵¹ Another impetus for this deep shift in the semantics of ‘force’ came from metaphysics. Recall from section 3, Wolff rejected as unintelligible Leibniz’s thesis that forces of bodies are grounded in mental (monadic) forces. So, Wolff made the force of his elements into a non-mental, physical trait—grounding body forces of *motion* and resistance to motion—and his disciples followed suit. (For mentalistic “force,” they coined *vis repraesentativa*, a term of art.)

I argue that du Châtelet does not pass this test either, because of three facts in conjunction. For one, she follows Wolff in asking that grounding must be intelligible: in elements, she claims, there “must be a principle of action . . . whereby we *can understand* why these changes [in bodies] occur at this time rather than some other, and in this way rather than some other.”⁵² But Wolff had used that condition to reject Leibnizian *idealism* about substance, precisely because mentalistic force was not an intelligible ground of physical force. For another, du Châtelet’s substantial forces are transeunt actions: through them, elements act on (and resist the actions of) other elements *extra se*. But the early-modern hallmark of mental agency is self-action, not outward mind-mind causation.⁵³ By *modus tollens*, acceptance of inter-substance action entails that the relevant forces are not mentalistic. Third and last, nowhere in her book does du Châtelet describe element-force as a *force de percevoir* or in any mentalistic terms. In conclusion, she

⁵⁰In Wolff and Kant, a physical monad is equipped with force of inertia located at a single point; hence mass is indivisible, being point-sized. In Boscovich, the unit of matter is a point-sized center of force, thus likewise indivisible. In both Kant and Boscovich, a single substance has a (small but finite) volume associated with it. But it is just a so-called effective volume, i.e. a spherical acceleration field, not a mass-filled ball. So, it is not divisible, whether physically or conceptually.

⁵¹Consider: “The soul is a substance, and so it is endowed with a power to act. The soul has a single force, . . . the force to represent [*vis repraesentativa*] the universe” (Thümmig, *Institutiones Wolfianae*, 162–64). “The soul’s essence consists in the force of representing [*vis repraesentandi*] the universe” (Johann Stiebritz, *Philosophia Wolfiana*, 290). “Our soul belongs in the realm of simple things. So, it must have a force whereby it represent to itself the things existing outside itself. From this representing force [*vorstellende Krafft*] we can explain all that is specific to the soul” (Christian Gottsched, *Weltweisheit*, 527–28).

⁵²Du Châtelet, *Institutions*, 126, emphasis added.

⁵³By contrast, for Leibniz, the inability to make outward-transeunt causation intelligible was a key reason to deny it to monads, by making them mind-like and their forces into powers of *self*-action alone—thus by embracing s-idealism. For a contemporary re-statement of Leibniz’s thought, shored up with explicit (deductive) arguments, consider: “No derivative [i.e. created] Monad can influence physically within another derivative Monad. . . . The changes in derivative Monads proceed from an internal principle. . . . Every derivative Monad is endowed with perception. . . . The internal actions of created Monads consist in nothing but continual changes in perceptions” (Michael Hansch, *Philosophia Leibnitii*, 76–84).

does not pass the second test for substance idealism, which again means that her doctrine of substance counts as s-realism.

The third test is decisive, and I submit that *Institutions* fails it as well. Start with criterion (3a) for idealism, as above. Du Châtelet has no official theory of efficient causation, but we can still infer her most probable view. For one, she claims to follow Wolff on the nature of elements, and he did assert that elements interact by efficient causation, inter alia (see section 3 above). For another, du Châtelet affirms that *bodies* interact, and that the elements' action and resistance is the sufficient ground of corporeal inter-agency. Short of Leibniz's way—which she did not take—transeunt substantial causation is the only other intelligible ground of outward bodily action.⁵⁴ So, we must infer that it was du Châtelet's considered view as well. As to the corollary criterion (3b), we must judge *ex silentio*. Commentators have already noted—without pondering its implications—that du Châtelet, allegedly a Leibnizian, does not endow her elements with perception and desire, the two mentalistic essentials of monadic idealism. Of course, she did not; as I explained, she denied they are intelligible grounds of body and its forces. Ergo, her metaphysics fails the third test for substance idealism.

From a broader perspective, du Châtelet seems to have been a philosopher in step with her times. As Kant began his rise, a college teacher called to his readers' attention how little favor monadic idealism had found in Germany: "Leibniz taught that even the elements of bodies have some force of obscurely representing this world—indeed of perceiving it, and of having desire [*appetitus gaudere*]. But very few have agreed with him on that count. Even among his disciples, most have objected to this view of his."⁵⁵ In light of my results above, to the list of objecting disciples we must now add du Châtelet.

5. IDEALISM: BODY

As du Châtelet's substance has no attributes *prima facie* corporeal, the question of idealism is even more complex in the case of material bodies. The question bifurcates, and so she must face it twice—with far from trivial consequences. Specifically, we must judge her doctrine from two standpoints with their own criteria:

Existence idealism: A body exists iff it is a member in the set of intentional objects common to mind-like perceivers.

Essence idealism: All the attributes essential to bodyhood are mind-dependent.⁵⁶

Let us apply the first criterion. Du Châtelet's substance idealism, I claim, has direct consequences for her view of body. Namely, as her elements lack primitive and

⁵⁴Leibniz's (late, canonical) way is of course the picture of every single monad acting on itself, by self-changing its own (representational) states, though always in divinely-ordained harmony (of semantic content) with the other monads in its possible world; and in accordance with the 'complete concept' of itself as a genuine individual. There is a third way—occasionalism—but it cannot have been du Châtelet's view. Occasionalism denies agency to any substance but God, whereas du Châtelet is adamant that elements too are active.

⁵⁵Nikolaus Burkhäuser, *Institutiones metaphysicae*, 269.

⁵⁶A similar but more fine-grained distinction is in Nicholas Stang, "Bodies, Matter, Monads."

genuine powers of mental representation, the existence of bodies qua dependent on element-minds is not a possibility in her doctrine. So, the *prima facie* outcome is that du Châtelet is a *realist* about the existence of body. A second argument confirms this conclusion. *Institutions* takes a body to consist in an aggregate (*assemblage, aggregat*) of elements: “bodies are Beings composed of several parts. . . . Composites are not Substances at all; rather they are aggregates of Substances, i.e. of simple Beings.”⁵⁷ While du Châtelet left “aggregation” undefined in her treatise, she admittedly relied on Wolff’s theory of “composite being” for key theses about body. And, in his theory, aggregation is a relation obtaining independently of mental activity: “We call a *composite* being that which consist [*constat*] of several parts distinct from each other.”⁵⁸ Ergo, du Châtelet too counts as a realist about the existence of bodies, which does not require any mental facts to ground it.

However, du Châtelet shifts gears abruptly in reverse when it comes to the essence of body. Recall what it is: the conjoined properties of extension, motive force and (force of) inertia. Now consider a decisive fact: she calls them “phenomena,” individually and together. She means the term, emphatically, as “*images or appearances born from the confusion [by our sense organs] of several realities.*” Likewise, “the Phenomena” of extension, motive force and inertia “result from the multiple realities” through confusion by *our* senses, she adds. In modern terms, a phenomenon is an *als-ob* representing by a human mind, with two species: (passive) perceptual belief and (active) imagining. These representings have intentional objects, namely, thing-like entities with variable properties. Du Châtelet calls these thing-likes “substantiated phenomena,” again following Wolff; and she carefully explains that intentional object and its element-grounds are distinct in essence: through a phenomenon “we represent to ourselves that which results from this confusion [in the senses], namely an image that is *infinitely different* from the realities entering into it.”⁵⁹

Into her concept of phenomenon, du Châtelet built two commitments, and each entails idealism about corporeal essence. (i) She takes ‘confusion’ in two senses, and one is etymologic: a fusing-together, or gluing-of-juxtaposites.⁶⁰ Namely, in perceiving an aggregate of distinct elements, the mind fuses them together into a whole of no-longer-distinguishable components; and then the minds regards the aggregate as *one*, or as co-moving, acting jointly or co-resisting:

We have already seen how the Phenomenon of extension results from the confusion of simple Beings. Now active and passive forces do likewise, to wit: every simple Being is always in action; and this action is related harmoniously to the actions of all simple Beings—thus all these conspiring actions must *appear* to our senses as a

⁵⁷Du Châtelet, *Institutions*, 140, 134. In truth, aggregates can be given *idealist* analyses as well—a lucid account is Hartz, *Leibniz*. So, it is not inevitable that aggregation is mind-independent. Still, I contend that Wolff is a realist on this issue, though more research is needed to settle the question. My evidence is that Wolff—in radical contrast to Leibnizian idealism—lets his substances be connected by real, mind-independent relations. Wolff-aggregation is ontologically parasitic onto these fivefold relations, or quintuple nexus. The basic Wolffian aggregate is the world (*mundus*), which is a set of simple substances aggregated via the *nexus elementorum* explained above, in sect. 2; then a body is any proper part of the actual world.

⁵⁸Wolff, *Ontologia*, § 531.

⁵⁹Du Châtelet, *Institutions*, § 155, emphasis added.

⁶⁰From Lat. *com-*, ‘with’ or ‘together’; and *fusio*, a melting, soldering, gluing.

single and unique action. . . . As we cannot represent distinctly one element's force from another, we grasp in the aggregate's force an infinity of things at *once* but without distinguishing them. For that reason, we confuse them into *one single* thing. (*Institutions*, 155, emphasis added)

Ergo, the unity of the aggregated phenomenon—a body's volume, motive force or net mass—is induced by the perceiving *mind*. But that is the acid test for idealism about non-basic ontological regimes—which bodyhood is, in du Châtelet's thought.

Moreover, (ii) the represented entity depends on the perceiving mind for its very *existence* qua substantiated phenomenon, or enduring thing-like with specific modes, and as subject of predication for appropriate perceptual beliefs. To illustrate her concept of phenomenon, du Châtelet uses one's perceptual awareness of green as one looks at a mixture of microscopic-size blue particles and yellow ones. She explains:

This degree of confusion and imperfection in our organs is *necessary*, if we are to see the objects such as we grasp them. A Being more perfect than us would have *wholly* different ideas, and would see things *entirely* differently from us. . . . For the Phenomenon of green would *not exist* but in virtue of this confusion [in our senses], and without it, there would *be* nothing but yellow and blue particles, placed one after the other. . . . Thus we understand that, as our sight was more distinct, the Phenomena that we take for *realities* would *disappear*. . . . And *all* the Phenomena falling under our senses—and which we take for realities—would disappear, one after the other. (*Institutions*, 153, emphasis added)

Du Châtelet's position is clear: no corporeal extension or force without a mind to represent it as such. That too is a mark of essence-idealism.

Objection: extension need not be mind-dependent, in du Châtelet. That is, any two or more elements could *be* an extended manifold just in virtue of *extra se* relations obtaining between them prior to any perception. Hence, for a body *B*, the unity of its extension, or volume V_B , need not be a mental fact.

I give a general answer: in du Châtelet's system, there remains an explanatory gap between (real, non-mental) inter-element relations and the (relational) properties essential to body qua perceived. That is, the essential properties have extra content *irreducible* to element-relations. The better explanation, I submit, is that this extra content is irreducibly mental: a (perhaps brute) fact about the cognitive makeup of senses like ours. That takes du Châtelet to the threshold of Kantian idealism about corporeal essence. For a concrete example, take extension. In *Institutions*, the element-level fact closest to being the metaphysical explanans of extension is the dyadic relation 'outside of,' *extra se*. Now we perceive bodies as *continuously* extended, whereas *extra se* is equally compatible with other kinds of *extensa*, for example, with discrete manifolds.⁶¹ 'Outside of' is a genus relation, whereas 'outside-of-qua-continuous' (extension) is a specific difference—hence the extension essential to bodies has an explanandum-remainder not captured by any elemental relations. Mutatis mutandis for the other two *essentialia* of body.⁶²

⁶¹And also with 'granular' extension, or manifolds isomorphic to the series of rational fractions.

⁶²Namely, *motive* force (and force of *inertia*, respectively) are specific differences, not captured by the generic attributes (*vis*) *activa* and *passiva*, which are elemental capacities for acting or resisting *generaliter*.

By consulting du Châtelet's sources, I have shown that her metaphysics has much in common with Wolff's equivalent doctrines, which in turn diverge sharply from Leibniz's monadic idealism. This result disproves the standard view that du Châtelet aimed to reconcile Leibnizian metaphysics and Newtonian science. Moreover, it directs us to look to Wolff for further light on the intricacies of du Châtelet's philosophy; and it locates her as a significant figure in the broad tradition of Enlightenment rationalism.

Examined on its terms, du Châtelet's metaphysics of material nature is a version of substance realism. Her grounds of body are neither mind-like nor mind-dependent. Though some details remain obscure, her view is realist, and so is her picture of bodies, which likewise exist qua real aggregates, without help from minds. However, a certain idealist strand seems to run through her ontology after all, at least pending a deeper look into it. Specifically, the essence of body is a conjunction of three mind-dependent attributes: a hallmark of idealist ontology.

She is, I have argued, a complex turning point in early-modern metaphysics: a Janus-faced realist looking to Leibniz but also to a future that ends in transcendental idealism.⁶³

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