

# ÉMILIE DU CHÂTELET'S METAPHYSICS IN LIGHT OF HER CONCEPT OF 'A BEING'

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While the first wave of contemporary Du Châtelet scholarship in the 1970s and 1980s read Du Châtelet's metaphysics as a stripped-down version of Leibniz-Wolffian metaphysics, the latest scholarship has argued against this by suggesting that Du Châtelet's metaphysics is a methodology for her physics and can be viewed in its own right. This latter interpretation, most prominently advanced by Brading, succeeds in putting Du Châtelet's metaphysical theory into the foreground, rather than viewing it as a flawed commentary on Leibniz and Wolff. Brading focuses on Du Châtelet's metaphysics as a methodology for the science of physics, with the core aim of answering how bodily interaction works. The present paper argues that Du Châtelet's primary concern in metaphysics is with the principles and main concepts of our cognition of beings. By analyzing her previously mostly overlooked concept of what 'a being' is in chapter 3, we will see that Du Châtelet's metaphysics investigates the principles and fundamental concepts of our cognition. The present paper thus asserts that Du Châtelet's metaphysics investigates our cognition of beings prior to and separate from serving as a scientific method for her physics.

**Keywords:** Émilie Du Châtelet; being; knowledge; essence; attribute; mode; substance; ontology; metaphysics; principle of contradiction; principle of sufficient reason; simple beings

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## Introduction

The main aim of this paper is to show that Du Châtelet's metaphysical theory investigates the principles of our cognition of beings as a question in itself, prior to serving as a framework for knowledge in physics or the natural sciences. To illustrate the difference, consider the following example: in the science of physics, I can seek an explanation for a certain experience I have of bodies; e.g., that they fall towards the ground or that they have a certain physical impact on each other if they collide. The value of my scientific explanation for this general behavior of bodies depends on certain premises, which I need to outline first. For example, I might say that my explanation must provide an intelligible reason that allows me to understand why all bodies behave in this way.

If, however, we put into question the premises of our cognition of beings, this does not concern scientific judgements in physics as in the example above. Rather, what we wish to establish are certain principles and concepts relating to how we are able to cognize beings at all. If I go out of my office and lock the room, I expect that nothing in it has changed when I come back. If I find my office in disarray, I might be uncertain as to *what* has caused the disarray (a cleaner, a robber, the wind through the window), but I am not in the least bit uncertain as to whether there has been a cause for the disarray. The principle, namely, that there must be a cause for the effect (which is implicit in the above assumption about my office, be it conscious or not) is not a scientific judgement in the first instance, but a principle of the way I cognize the world or beings in general. This can in turn offer a framework for knowledge of how bodies behave; i.e., for the explanation that they fall towards the ground owing to a cause, but nevertheless differs principally as an object of enquiry.

I will claim in this paper that Du Châtelet's metaphysics addresses, first and foremost, certain principles and concepts that pertain to how we cognize beings.<sup>1</sup> Scientific questions in physics in turn apply, and must not violate, these principles and main concepts of our cognition of beings. The claim being made here is best supported by presenting Du Châtelet's understanding of beings and our knowledge thereof explicated in chapter 3 of the *Institutions de Physique*, with recourse to the principles of knowledge, which she discusses in chapter 1.

In the first section, I will present a brief history of interpreting Du Châtelet's metaphysical framework in the *Institutions de Physique* and will outline that it 1) has been interpreted as a more or less flawed recapitulation of Leibniz's and/or Wolff's metaphysical theory and 2) has been investigated with regard to founding a theory of physics. In order to show that Du Châtelet's metaphysics, in the

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1. Du Châtelet speaks of *nos connaissances*, for which there is no exact matching word in English. The term *connaissances* falls between cognition(s) and knowledge. The term is akin to *Erkenntnis* in German, which is commonly translated as 'cognitions'.

first instance, concerns the principles and fundamental concepts of our cognition of beings (and only on this basis relates to judgements in the science of physics), I will, in the second section, discuss Du Châtelet's definition of 'a being', which is given in chapter 3 of the *Institutions de Physique*. In the third section, I will address how 'simple beings', as introduced in chapter 7 of the *Institutions de Physique*, fit into the metaphysical framework of how beings are principally intelligible to us, as outlined in chapter 3. The two historically advanced lines of interpretations of Du Châtelet's metaphysics named in relation to section 1 above, have, from the perspective of Leibniz-Wolffian metaphysics and from the perspective of her physics, predominantly viewed simple beings in chapter 7 as the core of Du Châtelet's metaphysics. I will thus discuss in section 3 of this paper why chapter 3 has been neglected in favor of chapter 7, and why we must recognize the importance of chapter 3 in order to bring Du Châtelet's metaphysics into full perspective.<sup>2</sup>

## 1. A Brief History of Interpreting Du Châtelet's Metaphysics

When Du Châtelet's works were first rediscovered by feminist historians of philosophy in the 1960s to 1980s, her contribution to the *vis viva* debate and her unifying position between the British empiricists and the Continental rationalists stood in the limelight, while her metaphysics was largely being read as an incomplete version of Leibnizian/Wolffian metaphysics (e.g., Barber 1967: 217–221, Iltis 1977: 36–38, Gardiner Janik 1982: 85–113). Moreover, because Du Châtelet makes strong references to Leibniz's metaphysics but discards large parts of his theory, including a robust account of monads, some scholars suggest

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2. Stan (2018: 480) is an exception in acknowledging chapter 3. He approaches the framing of Du Châtelet's concepts from chapter 3 and draws attention to her distinction between *possibilia* and actuality. Yet Stan's ambitious project in the paper is to compare Du Châtelet's metaphysics with Leibniz' and Wolff's—and to ultimately show that it is closer to Wolff than to Leibniz. I believe he succeeds in showing that many aspects of Du Châtelet's metaphysical foundation are closer to Wolff than to Leibniz (there are exceptions like the non-reducibility of the PSR to the PC or her view that essences do not have an intrinsic or prior reason). Although Stan considers chapter 3 prior to chapter 7, it is not a replacement for the present paper; firstly, because the focus on a comparison between Du Châtelet and Leibniz and Wolff does not allow for an investigation into Du Châtelet's ontology as extensively as it is provided here. Secondly, the aim of Stan's paper is to show that Du Châtelet is closer to Wolff than to Leibniz, while some subtle, but important, differences with Wolff are not part of his paper. For example, Wolff asserts in the German Metaphysics that possibility is not enough for a thing to be, while Du Châtelet attributes beingness to possibility, which is in turn important for her distinction between ideal and real beings, as we will see in section 2. Thirdly, and most importantly, Stan's exposition of chapter 3 is much less extensive than Stan's later focus on chapters 7 and 8. At the end of the paper Stan too considers simple beings and substances (real substances as referred to in chapter 7, not the definition of substance in chapter 3) to be the key theme of her metaphysics and drops the theme of essences introduced at the beginning of the paper.

that Du Châtelet's metaphysics is simply not getting Leibniz's right (Iltis 1977: 36–38; Gardiner Janik 1982: 102, 107). In response to this reading of Du Châtelet's metaphysics as an incomplete or even wrong version of Leibniz-Wolffian metaphysics, Brading's influential monograph *Émilie Du Châtelet and the Foundations of Physical Science* (2019) set forth that her metaphysics makes more sense if it is evaluated from the viewpoint of her physics and is understood as part of a unified goal, rather than one of two halves of the *Institutions de Physique*. Brading is not alone in this approach to the *Institutions*, an approach that addresses the metaphysical themes from the perspective of topics in physics, like gravity or bodily interaction (cp. also Hutton 2004: 520; Hecht 2012: 61–76; Hecht 2022: 175–96; Rey 2019: 35; Janiak 2018: 49–71). However, of all of these authors, Brading is most conscious of and explicit about the perspective she takes on Du Châtelet's metaphysics. Brading asserts that we must ask what methodological role her metaphysics plays for her physics and more specifically for the question of bodily interaction. She writes:

With this information in hand, we should expect the method that she develops in her early chapters to be directed toward securing knowledge of causes, and this is exactly what we find, as we shall see. We should also expect Du Châtelet to draw on metaphysics only where it is needed in order to address questions arising in physics. I believe that this is how we should approach the metaphysics that we find in the text, including the metaphysics that Du Châtelet introduced in her revisions to the manuscript. In the reading of the Foundations offered in this book, the problem of bodily action takes center stage. (2019: 7)

This perspective on Du Châtelet's metaphysics as providing a methodological framework for her physics sets things right in response to the earlier evaluation of Du Châtelet's metaphysics. First and foremost, Du Châtelet's metaphysics was now being read in its own right and independently of the question of whether or not she comprehends Leibniz's or Wolff's metaphysics correctly. Viewing the aim of the book as centering around physics, and her metaphysics as supporting this end, is further legitimized by Du Châtelet's explicit intention of contributing to physics, as expressed in the preface, and by the overall weight the book places on themes like the elements of matter, causal interaction, and so forth. What Brading has established through her thorough work in the history of natural philosophy and physics is that all of Du Châtelet's metaphysical premises are relevant to addressing the question of bodily interaction and are thus an integral and inherent part of her physical theories. This conclusion is not being contested here.

While this perspective on Du Châtelet's metaphysics, which considers it a methodological framework for her physics, is fruitful and, as an end, correct, it

lays the focus of investigation, with regard to her metaphysics, on the (methodological) role it plays for bodily interaction and physical causes.<sup>3</sup> We must now put a further important aspect of her metaphysical inquiry into the picture. This aspect is that Du Châtelet's metaphysical theory investigates the principles and fundamental concepts of how we cognize the world in the first place. It is only on this basis that her metaphysics establishes a methodological framework for knowledge in the natural sciences. The purpose of this paper is to outline this important and thus far neglected aspect of Du Châtelet's metaphysical theory.

Du Châtelet considered herself an excellent metaphysician, often expressing a keen interest in metaphysics in her letters (Letter to Frederick II in Edwards (1989: 7)). Given the historical context Du Châtelet was writing in as a woman, it is not at all clear whether or not she could have presented her work publicly as establishing an independent metaphysical theory. Taking this context into account, it may be more of a hint to subsequent generations than a flawed colloquialism when she calls her main work 'essay on metaphysics' in letters (COR, Letter to Frederick II, April 1740, Lettre 286, 576). Hence, it is not as clear as it may first appear that the metaphysical theory set forth in the *Institutions de Physique* is not also of crucial interest in itself to Du Châtelet, although it is *also* relevant for the physical questions posed therein. Be this as it may, Du Châtelet makes clear that her metaphysics in its content does not deal with knowledge advanced in physics. Metaphysics to her deals with 'that which all people who make good use of their understanding can know' and is fundamental for 'all knowledge' (Inst1740eZ, XII; §1).

If we wish to bring Du Châtelet's metaphysics in its initial purpose of addressing the principles and fundamental concepts of our cognition of beings into the picture, we must focus on chapter 3, where she expounds, in recourse to chapter 1 on the principles of knowledge, her understanding of 'a being'. In chapter 3, Du Châtelet asserts that she is putting forward a definition of what a being is and that the definitions of the most important concepts of metaphysical truths—i.e., essence, attribute, mode, and substance—rest upon it.<sup>4</sup> It is here too that she elucidates how beings are comprehended in their essence, attributes,

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3. Similarly, Janiak analyses Du Châtelet's enquiry into knowledge with an interest in her attempt to answer some of the most pressing questions posed in physics in her epoch (see 2018: 49–71). His aim is to show, with a view to her physics, that she cannot simply be seen as a Newtonian. See also Slavov on Du Châtelet's 'intelligible physics'; an approach he attributes to problems related to gravity Newton had left open (see 2020: 129–57).

4. Please note that Du Châtelet changed this passage significantly in the 1742 edition, compared to the 1740 edition. In the 1740 edition she speaks of 'physical' truths, while she writes in the 1742 edition: 'I consider it highly necessary to provide you here with a very precise idea of what you must understand by these words [essence, attributes, modes] because the most important truths of metaphysics, as well as further truths of physics, depend on the true notion of essence, of modes and of attributes' (Inst1742: §32).

and modes on the basis of the principles of knowledge.<sup>5</sup> It is only if we look at chapter 3 prior to chapter 7 that we will be able to see clearly that Du Châtelet's metaphysics are not only to provide a framework for the natural sciences, but instead are also (and in an epistemological sense primarily) to ground how we cognize a world of beings in the first place.<sup>6</sup> We must not ignore chapter 7 and the concept of simple beings within this picture, of course. However, we must begin with Du Châtelet's understanding of what a being is and how it can be known and then examine 'simple beings' in this context.

## 2. Du Châtelet's Understanding of 'A Being' and its Intelligibility

### 2.1 *Du Châtelet's definition of 'a being' based on the Principle of Contradiction*

Leading up to her more precise specification of the word 'being' in chapter 3, Du Châtelet first of all turns to the distinction between possibility and impossibility, which in turn becomes relevant for what a being is to her. She writes in §33: 'That which is impossible cannot exist, for one calls impossible that which implies contradiction; yet if that which implies contradiction could exist one thing could be a being and not a being at the same time; which is demonstrated as false for all people' (Inst1740eB, §33). We can see here that she ties the notion of the possibility and impossibility of the existence of a being to the intuitive and absolute validity of the principle of contradiction (henceforth PC) for all people. To Du Châtelet the PC, just like the principle of sufficient reason (henceforth PSR), is a principle of our cognition and knowledge (*connaissances*) (Inst1740eZ, §1). Subsequently, she explicitly bases the definition of 'a being' on the PC and thus on possibility (in separation from a being's actuality or existence). She writes:

Therefore one calls a *Being* that which can exist, and whose determinations do not imply any contradiction, whether this Being exists, or whether it is only possible. For we often speak of past or future Beings, and as a result give the name *Being* to all that is possible, whether it exists or not. But we call a *Being of reason*, or *chimera*, that which implies con-

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5. Du Châtelet treats 'essence', 'attribute', and 'mode' as notions or ideas. They need to be defined in order to arrive at a true notion of 'essence', 'attribute' and 'mode' (Inst1740eB: §32).

6. The main aim of the book and of introducing her 'metaphysics' may still be to develop a framework for physics, or more specifically, for the question of bodily interaction.



tradition and can never exist, that is to say, that which is impossible.<sup>7</sup>  
(Inst1740eB, § 35)

It is interesting to note here, as it has far-reaching consequences for Du Châtelet's metaphysics, that being 'a being' thus does not depend upon an actual existence of this being, but rather on the *possibility* of its existence, according to a principle of knowledge. This will subsequently enable Du Châtelet to distinguish between 'ideal beings' and 'real beings'. Ideal beings are products of the mind, which 'exist'<sup>8</sup> only through real beings (of which they are abstractions), whereas real beings exist through themselves. The ideas of space and time are ideal beings to Du Châtelet, as are numbers.

Furthermore, Du Châtelet will, on the basis of her understanding of 'a being' as possibility, claim that the essences of all beings (including the essence of a real being like a rock) are eternal and immutable. These eternal and immutable essences of beings can be known by the human being, as we will see in the following. But first, let us turn to her distinction between ideal beings and real beings.

## 2.2 Real Beings and Ideal Beings

In order to understand what kind of beings Du Châtelet has in mind when she defines beings in terms of their possibility, it makes sense to look at the passages that follow. The first passage shows us that her definition of 'a being' as anything whose determinations do not imply contradiction includes real beings that surround us. She writes: 'When we consider the Beings that surround us, we notice in them both variable and constant determinations: a rock, for example, is sometimes hot and sometimes cold, but it is always hard, composed of parts, and heavy' (Inst1742, §36). We can see from the fact that Du Châtelet uses a rock as an example that her definition of a being includes physical, sensory objects that exist in time. Du Châtelet calls those beings 'real beings', 'existing beings', or 'actual beings' synonymously.

By founding the definition of 'a being' or 'a thing' on possibility or non-contradiction, and not on existence, being can be attributed to ideal beings (such as time and space as abstractions) as well as to beings that are not actual or existing (such as a Tyrannosaurus Rex), yet also to real beings such as the computer in front of me. On this basis, beings of the mind without actuality through

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7. Wolff defines 'things' in this manner—i.e., based on possibility and the PC—but says that 'possibility' is not enough for something to be a 'being' (Wolff: *Vernünfftige Gedancken*, Ch. 1, §15f.).

8. I want to point out with the apostrophe that they 'exist' through something actually existing, but are themselves only 'ideal beings', i.e., do not exist in the strict sense, which Du Châtelet wishes to point out.

themselves can be distinguished from a chimera; i.e., a ‘non-being’, or in other words an idea that contains a contradiction, such as a triangle with four sides. This gives Du Châtelet a language to speak of ‘abstractions’, ‘acts of the mind’, or ‘the formation of ideas’, and to call those beings that are formed on the basis of abstraction or acts of the mind, in distinction from real beings, ideal beings.<sup>9</sup> An ideal being to Du Châtelet is a being that comes about through an abstraction of the mind, yet has no independent existence from real beings in itself.<sup>10</sup>

### 2.3 *Real and Ideal Beings with a view to Space and Time*

Du Châtelet’s distinction between real and ideal beings becomes especially relevant in her discussion of the concepts of space and time, where she describes the notion of space by ‘how we came to form the idea [of extension, space and continuity]’ (Inst1740eB, §77) and the notion of time by ‘an analysis of our ideas’ (Inst1740eZ, §96). Acts of the mind and their result can, on the basis of her concept of ideal beings, be distinguished from mere fallacies of the imagination or chimeras: space and time as ideal beings are not real in themselves, like a container, but they are nevertheless non-contradictory beings and have a reality, actuality or existence in their relationship to real beings.<sup>11</sup> Despite lacking reality independent of real spatial and temporal beings, the ideal beings, such as the ideas of space and time, are not a fallacy or a mistake, but a true notion, and they play a role in the cognition of the world<sup>12</sup> (Inst1740eB, §86).

In Du Châtelet’s view, space and time as ideal beings do not exist independently of the real beings from which they were abstracted (i.e., as stated they do not exist like a container) (Inst1740eB, §84; Inst1740eZ, §102), but they do exist in the sense of real beings actually being in a spatial and temporal order

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9. Du Châtelet introduces the distinction between actual and possible in §9 and equates actuality with the existence of a being. In Chapter 4 and 5 on Time and Space Du Châtelet speaks of existing beings as ‘real beings’. I therefore take ‘actual’, ‘existing’, and ‘real’ beings to be the same (physical sensorily perceivable objects), but they are used in different contexts to express different oppositions. For example, Du Châtelet usually refers to ‘actual’ or ‘existing’ beings in order to distinguish them from ‘possible’ beings without actuality, while she speaks of ‘real’ beings to distinguish them from ‘ideal’ beings.

10. Du Châtelet’s ideal beings are sometimes called ‘fictions’ in English (Wells 2021b: 1137–48; Sidzinska 2024). It is important to note that ideal beings are fictions in the sense of them being dependent on the faculty of the mind (*esprit*) or the imagination, but they are not fictions as in a dream or a fantasy, since they play a role in the way we cognize beings. They adhere, differently to the fabulous imaginations of a dream, to the principles of knowledge.

11. The same is the case for numbers, which are ideal beings.

12. Cp. Hagengruber (2022) on the role of the concept of space for recognition, as well as Carus (2022) on the concept of time in Du Châtelet. Cp. also Lin (forthcoming) on the concept of space.



(Inst1740eB, §79). Over and above the spatial and temporal existence of real beings, the ideas of space and time are 'something' in our mind. This 'something'—i.e., ideal being in our mind—enables us to *understand* real beings in their spatial and temporal existence and enables us to view them in an order<sup>13</sup> (Inst1740eB, §86; Inst1740eZ, §101).

Let me illustrate this point. According to Du Châtelet, to be able to understand that the cause is before the effect, for example, it is necessary to have an idea of space and time and to be able to see real beings in a spatial and temporal order. Hence, the fact that ideal beings—e.g., space and time—are formed in our mind makes a difference for how we cognize beings. Thus, ideal beings, although they cannot exist independently of real beings, are not 'nothing'—they do play a crucial role in how we cognize the world. Du Châtelet's distinction between the concept 'being' and the concept 'existence' or 'reality' enables her to grasp this role of the mind, which is constitutive of how we know of the world as something that 'is'. Space and time are then not 'real beings', as they were for the Newtonians, since *they do not exist* like a container, independently of real beings. They are 'something' since their ideal being in the mind is described and defined as an integral aspect of what beings are to us. They are ideal beings: ideas of the mind which do not exist independently of the real beings' temporality and corporeality, but which nevertheless play a crucial role in being able to cognize beings in the way we do (i.e., as temporally and spatially ordered, as causal etc.) (Inst1740eB, §86; Inst1740eZ, §108).

As we saw, Du Châtelet defined 'a being' as something which 'can exist'. Ideal beings, however, cannot exist in and of themselves, according to Du Châtelet. This, at first glance, appears to be a contradiction in terms, but Du Châtelet's point is: ideal beings, space and time, can and do exist; i.e., real beings really are temporal and spatial, yet space and time exist in their relation to real beings and not without this relation. The 'created' abstract notions of space and time in the mind have a being with a view to an understanding of 'real beings', their relationships and order.

This distinction between 'real beings' and 'ideal beings' in Du Châtelet is important with regard to how beings are intelligible to us, independently of knowledge in physics: the ideas of space and time and their relation to real beings, in the manner in which any human being cognizes them, is being explicated here by Du Châtelet. Her elaboration concerns the 'formation of the idea of space' and an 'analysis of the idea of time' in the manner in which anyone has an idea of space and time—in the absence of any notion of physics. Furthermore, the process she describes in the formation of these ideas through the faculty of

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13. For a more detailed account of the role of the mind and the role of real beings in the constitution of the ideas of time and space, as well as a comparison to Kant's notion of space and time, see Carus (forthcoming).

imagination in the mind is in the first instance an unconscious process, which leads to human beings having an idea of time and space without having to know what space and time are in an ontological or metaphysical sense, i.e., without having to know how these ideas come about.

Let us now turn to a further aspect of her ontology in chapter 3, which delves into how beings are intelligible to us.

#### ***2.4 Knowledge of beings in their (eternal) essence and the relationship of real beings to essence***

On the basis of her definition of beings, as that which can exist—i.e., is possible—Du Châtelet in chapter 3 goes on to say that the essences of beings (that which makes them a being) are eternal and immutable. The eternal essences of beings are intelligible to us on the basis of the PC. The actuality of beings is also intelligible to us—on the basis of the PSR—as we will see in the subsequent section, but the actuality of beings is subject to change. The intelligibility of essences is interesting for our theme, as it shows that beings cannot only be known in their actuality and be traced back to ‘metaphysical’ simple beings as the origin of their corporeality and extension. Rather, Du Châtelet’s metaphysics also asserts that beings (and this includes the essence of actual beings, such as a rock) can be known in their eternal essence (Inst1740eB; §38).

The essential determinations of a being are, according to Du Châtelet, what make a being possible, and the definition of an essence is based on the PC.<sup>14</sup> She writes:

Divine understanding is the source of all that is possible, because all possible things with all their possible determinations are contained therein. But the essences of things (that is to say, the first determinations by the combination of which they become possible, and from which all their properties flow) have their foundation in the principle of contradiction: they are possible because it does not imply any contradiction that such or such determinations can be assembled in such or such a way. (Inst1740eB, §48)

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14. We will recall that the definition of ‘a being’ is also based on the PC. The difference between the definition of a being and the definition of an essence is that a being can also have attributive and modal determinations, while the essential determinations are not themselves the subject of attributive and modal determinations.

The picture presented here is that all non-contradictory sets of essential determinations form the essence of one being.<sup>15</sup> Du Châtelet also writes in this vein: 'If in the place of one of the sides of a triangle, one puts two others, one neither destroys nor changes due to this the essence of the triangle; but one makes a four-sided figure, that is to say, a being of a new kind' (Inst1740eB, §46). In other words, the substitution of an essential determination with another determination actualizes a different being without changing the possibility or the essence of the first. If we change the figure to a square, we actualize a being of a new kind while the essence, the being, of a triangle remains the same. Essences of beings are *possibilia* and are thus eternal and immutable—something that was possible at some point in time cannot be impossible at another time, and vice versa.

As we have seen above, a being need not be 'actual' or 'existent' to be a being—the essence is so to speak enough for a being to 'be', but not for it to 'exist' or to be 'actual'. However, it is important to note that beings that do exist and are actual always and necessarily have an essence. Essence is thus not a concept that remains entirely in the realm of *possibilia*—for a being can be possible *and* exist. An actual being, like a particular existing rock, has an essence, which consists in it being hard, heavy, and divisible (Inst1740eB, §36, §45). This essence itself is not dependent on the existence of this particular rock but pertains to all possible rocks. The (eternal) essence of this actual being (a rock) can be known; i.e., it is intelligible to the human being on the basis of the PC in Du Châtelet.

The eternity of beings in their essences, which pertains to possible *and* existing beings, does not concern their corporeality as such because the physical corporeality of the rock changes and perishes, while the essence of a rock remains the same. Du Châtelet's 'doctrine of essence', as she herself calls it, has thus, from the perspective of physical questions relating back to Du Châtelet's metaphysics, been mostly overlooked.

## 2.5 *Knowledge of the actuality of beings in their attributes and modes*

On the basis of the fact that a being can be merely possible, but can also, in addition to this possibility, be actual, Du Châtelet contends that there must be a cause for the actuality of beings beyond their possibility (Inst1740eB, §38). She

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15. We may of course ask ourselves what it is that creates the unity of these determinations, i.e., holds them together in one being. Furthermore, we may say that the determinations themselves are more than just non-contradictory with regard to other determinations; i.e., 'hard' (an essential determination of a rock) is in itself different to 'soft'. Du Châtelet does not address either of these questions directly.

writes: 'All that is possible is not actual, although all that is actual is possible. Thus, there must be an external cause for actuality (that is to say, for existence) which is the complement of possibility' (Inst1740eB, §39). It is important to Du Châtelet that this cause for the actuality of beings is intelligible to the human mind. To Du Châtelet, the actuality of beings is expressed in attributes and modes and rests on the PSR.<sup>16</sup> She asserts that the PSR is a principle all people assume naturally in their comprehension of the actuality of beings, without having to reflect on it. To prove the absurdity of the negation of this principle of knowledge, she writes:

For example, I declare that all is still in my room in the state in which I left it, because I am certain that no one has entered since I left; but if the principle of sufficient reason does not apply, my certainty becomes a chimera, since everything could have been thrown into confusion in my room, without anyone having entered who was able to turn it upside down. (Inst1740eB, §8)

Du Châtelet expounds how we are to understand the actuality of beings on the basis of the PSR through her concepts of attribute and mode. The actuality of a mode is not dependent on the essence of a being, but follows, in accordance with the PSR, from an antecedent mode or an exterior being, which creates a new mode (like the sun's rays creating the warmth in a rock) (Inst1740eB, § 44). Attributes, according to Du Châtelet, are *permanent* determinations of a being and are *dependent* on the essential determinations of a being,<sup>17</sup> insofar as they have their sufficient reason in those primordial essential determinations.<sup>18</sup> The shape of a rock, for example, is grounded in the essence of a rock and is what it is through this grounding in the rock, while the hardness as an essential determination is not grounded in yet another determination. Both essential and attributive determinations are constant in a being, yet attributive determinations have a ground or reason in the essential determinations, while the essential determinations are 'primordial', as Du Châtelet states; i.e., they enable us to cognize a being as this being and have no reason or grounding in anything else. Attributes thus depend on essences by their very definition and have their *sufficient reason* in the essential determinations and cannot legitimately be attributed to a different being.<sup>19</sup>

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16. Wells has pointed out that the principle of sufficient reason in Wolff pertains to necessary truths also, which is not the case in Du Châtelet (2021a: 629–55).

17. Unlike the modal determinations.

18. We will recall that primordial essential determinations do not have a sufficient reason in any other determinations (Inst1742, §41).

19. Du Châtelet's argument against Locke's hypothesis of 'thinking matter' is based on this theory of attribution.

This theory is a theory of our knowledge of the actuality of beings and puts forward that the actual existence of beings in their attributes and modes is intelligible based on the PSR as a principle of knowledge. Hence, it is a metaphysical theory of the principles and main concepts of our knowledge of the actuality of beings and not in the first instance an investigation into the foundations of questions in physics. However, this metaphysical theory of how beings in their actuality are intelligible in turn establishes a universal foundation for the sciences, since hypotheses and conclusions in the sciences need to be in line with the principle that is fundamental to what beings are in their actuality and to our everyday prescientific understanding of it.<sup>20</sup> In assumptions on a being's attributes, the natural scientist reasons in line with the PSR as the principle that is fundamental to what an attribute is, according to Du Châtelet, in order to arrive at correct conclusions and not be led astray by imaginative and arbitrary assumptions.

## **2.6. Brief Summary of Section 2**

We saw in this section that Du Châtelet's understanding of what a being is in the third chapter: 1) enables her to distinguish between real beings and ideal beings; 2) gives her a language to speak of ideal beings, such as space and time as ideas of the mind, which are constitutive of our cognition of beings; 3) establishes her notion that beings in their essence are eternal, immutable, and intelligible to the human being through the PC; and 4) lays the foundation for her notion that the actuality of beings is intelligible through the PSR. All of these points are an expression of her metaphysics in and of itself and explicate, in the first instance, the human being's cognition and knowledge of beings.

The last category or kinds of beings Du Châtelet investigates, namely simple beings, are not introduced in this context of chapter 3, where she discusses the intelligibility of beings in their essences and their actualities based on the principles of knowledge. Simple beings are introduced in chapter 7 in relation to the elements of matter. Let us thus, in a new section, turn to simple beings and ask what they are and what relation they have to Du Châtelet's understanding of the intelligibility of beings outlined in chapter 3.

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20. For a detailed account of the epistemology of hypotheses in Du Châtelet, see Paganini (2022, esp. 30–42). Paganini establishes that Du Châtelet puts forward 11 rules for proper hypothesizing. He also points out that and how the principles of knowledge regulate her theory of hypotheses (cp. 41).

### 3. Simple Beings in Chapter 7

Along with the perspective on Du Châtelet's metaphysics from the *forces vives* debate, natural causes, or bodily interaction, Du Châtelet's understanding of beings and her ontology as a whole have often been approached specifically from her distinction between simple and compound beings, as presented in chapter 7 (Iltis 1977: 36; Jacobs 2020: 68; Brading 2019: 58ff, 74; Lyssy 2022: 200; Wells 2021a: 1139). This is because in chapter 7 Du Châtelet aims to provide us with an explanation for the elements of matter. In this context of the elements of matter, she puts forward an explanation for compound beings based on the theory of simple beings. This theory of the metaphysical foundation of the corporeality of real beings in simple beings in chapter 7 in turn provides the foundation for her arguments for living forces and other physical theories concerning the roots of the behavior of bodies. Because of its direct significance for Du Châtelet's theory of the interaction and behavior of bodies, and her physics in general, chapter 7 has been put into focus when scholars sought after the metaphysical foundations for scientific judgements in physics in the *Institutions de Physique*. The main focus on chapter 7 over and above chapter 3, however, does not put Du Châtelet's metaphysics as a whole into the picture.

Another reason for the dominance of chapter 7 in the interpretation of her ontology over chapter 3, is the fact that Du Châtelet was read by scholars, in the first wave of scholarship of the 1970s and 1980s, who were highly familiar with Leibniz's theory of monads and therefore interpreted the *Institutions de Physique* as presenting a version of his ontology. On this basis, Du Châtelet's 'world-view' or 'ontology' was thought to be founded on 'simple beings'. Gardiner Janik, for example, writes:

She replaces the 'two-tier' world picture of Newton, composed of atoms and their normally visible aggregates, with a 'three-tier' picture, in which atoms themselves are material extended aggregates of 'êtres simples', and normally visible objects simply larger, more complex aggregates yet. Once this ontological picture has been introduced (and its details spelled out in the new chapters seven to ten), the original vague project of an ultimate justification of truths of Newtonian science could be given real substance. (1982: 106)

It is suggested here that we can derive Du Châtelet's main ontological picture from simple beings introduced in chapter 7 and their relation to 'extended aggregates'. While simple beings certainly play a role in Du Châtelet's ontology, in chapter 7 they are investigated with the explicit aim of giving a sufficient



reason for extended bodies, bodies which would otherwise be inexplicable. The context of chapter 7, in which simple beings are first mentioned, never purports to provide an ontological framework, to define what a being is, or to expound the principles and main concepts of our knowledge of beings. How then do simple beings fit into the framework of Du Châtelet's metaphysics, as set out in the third chapter?

As mentioned above, the introduction of simple beings in chapter 7 is prompted by the intention of providing an explanation or reason for the existence of extended compound beings on the basis of the PSR. Du Châtelet writes:

All bodies are extended in length, width, and depth. Now, as nothing exists without a sufficient reason, it is necessary for this extension to have a sufficient reason that explains how and why it is possible; for, saying that there is extension, because there are small extended particles, comes to saying nothing, since the same question will be asked about these small extended particles as about extension itself, and the sufficient reason for their extension will be asked about in turn. Now, as sufficient reason obliges us to state that a thing is different from what one is asking about, since otherwise no sufficient reason is provided and the question always remains the same, if one wants to fulfill this principle about the origin of extension, it is necessary to come in the end to something that is without extension, that has no particles, to give a reason for that which is extended and has particles. Now, a being without extension and without particles is a simple being; so, compounds, extended beings, exist because there are simple beings. (Inst1740eZ, §119)

Simple beings fulfil the role here of providing a reason for the existence and actuality of compounds. Du Châtelet's argument for simple beings is that without them the existence of compound beings would have no sufficient reason at all (which would be a violation of the PSR). Du Châtelet presupposes that it is 'necessary to arrive at necessary things when explaining the origin of beings' (Inst1740eZ, §121). Because bodies are not necessary, Du Châtelet concludes that the internal differences in matter—i.e., one body as opposed to another—must be rooted in something other than matter itself, something necessary: namely, simple beings. In being their sufficient reason, simple beings serve as a foundation for real or compound beings and as an explanation for their existence. Du Châtelet identifies her simple beings with Leibnizian monads (although there are important differences: she does not say that they have perception and human beings and animals do not have a dominant monad for her). She also calls simple beings 'the real substances' (Inst1740eZ,

§127). In order to understand simple beings better, it thus makes sense to consult Du Châtelet's definition of substance, which she believes is the first adequate one in history.<sup>21</sup> Substance is defined by Du Châtelet in chapter 3 as follows:

Thus, the essence is the source of the attributes and of the possibility of the modes; therefore it is like the support and the sustainer of all that can suit the Being; and one can define Substance, that which conserves the essential determinations and the constant attributes, while the modes in it vary and succeed one another, that is to say, a durable and modifiable subject: for insofar as it has an essence and properties that flow therefrom, it endures and continues to be the same, and insofar as its modes vary, it is modifiable. (Inst1740eB, §52)

A substance to Du Châtelet is thus a durable and simultaneously modifiable subject. If we turn back to the concept of simple beings on this basis, simple beings being the only true substances should entail that they are durable and modifiable. In our experience of actual compound beings, such as a rock, we note a unity, which 'conserves the essential determinations and the constant attributes' and is modifiable (Inst1740eB, §52). This unity, the rock, however, ceases if the compound being ceases to exist. Thus, we may conclude, the only true substances should, differently to compound beings, be entirely durable according to Du Châtelet's definition of substance. Simple beings are durable unities, which enable the finite durable unity of compound beings, but do not cease to exist when they do.<sup>22</sup>

With respect to their intelligibility, Du Châtelet claims that we only know of simple beings through the understanding, while our imagination and our senses have no access to them, for they cannot be represented in a picture. We epistemically deduce simple beings (and their properties) from compound beings on the basis of the PSR. She maintains that we lack a clear idea of the internal states of simple beings and the interrelation between them (Inst1740eB, §134). We thus have some principal constraints in the access the human mind has to simple beings.<sup>23</sup> As a result, we must be careful to distinguish essences of beings,

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21. She writes: 'Substance is something that the whole world talks about and for which no one has yet given a good definition' (Inst1740eB, §51).

22. For Leibniz, of course, monads are not modifiable. For a detailed comparison between Leibniz' monads and Du Châtelet's simple beings, see Carus (2024).

23. Illits (1977: 36) argues on this basis that the relationship between phenomenal and substantial levels of nature remain unexplained and unconvincing in Du Châtelet. She writes: 'Although du Chatelet attempted to present a Leibnizian analysis of the relationship between the phenomenal and substantial levels of nature and between the parts of an aggregate, she did not really try to

which are principally knowable, representable, and can become actualized in real beings, from simple beings as 'the real substances', in respect to which the human faculties are restricted in various ways: we do not have access to their internal states or their interrelation, and we cannot picture them through the senses or the imagination.

The human being can thus principally know real beings with a view to their essence and their actuality on the basis of the principles of knowledge, while the elucidation of why compound extended beings exist and are given to us in the way they are (as a unity) is restricted to the positing of simple beings by the understanding on the basis of the PSR.<sup>24</sup> We are thus confronted with a more complex Du Châtelean world-view or ontology than the one Gardiner Janik suggested in the quote cited earlier.

On the one hand, all beings have eternal essences, which are intelligible to the human being on the basis of the PC. Actual beings have, in addition to this, a reason for their actuality, which is intelligible to the human being on the basis of the PSR. This means that the world of beings is in principle intelligible to us. Du Châtelet draws many concepts and consequences from this principled ontology, as we saw in section 2. Simple beings, on the other hand, are Du Châtelet's answer to the question of *why* there are extended beings. Du Châtelet rules out the assumption that 'there is extension because there is extension' as a sufficient reason for extended beings because it is circular and contentless. As a result, extended atoms may exist but they are ruled out as a sufficient reason for extension. On the basis of Du Châtelet's reasoning, the only possible reason for the existence of extended beings is thus something non-extended: simple beings. Consequently, simple beings, to Du Châtelet, do not form the foundation for *what* beings are or what they are to us — i.e., her ontology — but instead they serve to explain *why* extended beings exist as this compound, essential, attributive, and modifiable unity.

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clarify the logic of these relations. This left her account incomplete and unconvincing.' However, Du Châtelet's metaphysics do, as we have seen, clarify 'the relationship between phenomenal and substantial levels of nature' in detail in chapter 3. The lack of inference concerning the relationship between simple beings and compound beings is the result of a conscious conclusion about what can be known about simple beings (and about the reason for the existence of corporeal bodies), while the relationship between essences, attributes, and modes and how beings are intelligible to us is elucidated in detail by Du Châtelet. In turn, we can establish that the senses present phenomenal nature, which we can know about with certainty only through the application of the mind to them and on the basis of the principles of knowledge (cp. on phenomenality in Du Châtelet Rey (2017), Carus (2024)).

24. Cp. Detlefsen 2019, 22 on the deduction of simple beings from material beings on the basis of the principles of knowledge.

#### 4. Conclusion

I claimed in the introduction and in section 1 that Du Châtelet's metaphysical theory is better understood by Brading's interpretation of it as serving as a methodology for physics (and more specifically for the question of bodily interaction) than by previous scholars who saw her metaphysics as an incomplete understanding of Leibniz's or Wolff's metaphysics. Brading successfully established that Du Châtelet's metaphysics is not a stripped down or incomplete Leibniz-Wolffian metaphysics and that it provides a framework for her physics. A key aspect of her metaphysics that had not come into focus from this perspective is that it is in the first instance concerned with the principles and fundamental concepts of our cognition of beings. I showed that this is the case by investigating Du Châtelet's previously understudied chapter 3, in which she provides us with the definition of what a being is. We saw that this definition on the basis of possibility enables her to develop an ontological theory that distinguishes between ideal and real beings and that explicates the intelligibility of beings in their essences, attributes, and modes on the basis of the principles of knowledge.

The science of physics, in turn, cannot violate this foundation of how beings are intelligible to us and applies the principles of this foundation in its discoveries. In the sciences, we have to demonstrate that our results are in line with the PC and the PSR as principles of knowledge, not only to ensure that the results are correct but also and importantly to make them intelligible to other rational beings who think according to the same principles and employ (or should employ if they reflect on the concepts correctly) the concepts of essence, attribute, and mode in the same way, according to Du Châtelet. Natural science is therefore bound by the universal and self-evident foundation of our cognition of beings, both in its demonstrations and in its concepts. It is thus true that Du Châtelet in her metaphysical theory develops a basis for physics, yet not with a focus of solving questions in the science of physics itself, but primarily with a focus on the question of how beings can be known in the first place.

As outlined in section 2 of this paper, beings in their essence and in their actuality are in principle comprehensible and knowable through human understanding. Du Châtelet provides us with an elaborate theory of what beings are and how they are cognized. The foundation of real beings on simple beings in chapter 7 is a derivative aspect of Du Châtelet's ontology set forth in chapter three. We can conclude that beings can, in principle, be known in Du Châtelet's metaphysical theory, while knowledge of the reason for the extended existence of compound beings is restricted. In other words, we can, in principle, answer the question of *what* beings are, while the answer to the question of *why* compound extended beings exist is limited to tracing them, and their properties, back to simple beings.

## Competing Interests

The author has no competing interests to declare.

## Bibliography

### Primary Sources

- COR: Du Châtelet, Émilie. *La Correspondance d'Émilie Du Châtelet*. Edited by Ulla Kölv-ing and A. Magnan, 2 vols. Ferney-Voltaire: Centre International d'Etude du XVIIIe siècle.
- Inst1740: Du Châtelet, Émilie. 1740. *Institutions de Physique*. Paris: Prault.
- Inst1742: Du Châtelet, Émilie. 1742. *Institutions physiques de madame la marquise Du Chas-tellet adressés à M. son fils: Nouvelle édition, corrigée et augmentée considérablement par l'auteur*. Amsterdam: Aux dépens de la Compagnie.
- Inst1740eB: Du Châtelet, Émilie 2017 (1740). *Foundations of Physics*. Translated by K. Brading, a.a., available at [www.kbrading.org](http://www.kbrading.org).
- Inst1740eZ: Du Châtelet, Émilie. 2009 (1740). *Foundations of Physics*. In *Selected Philosophi-cal and Scientific Writings*. Translated by I. Bour and J. Zinsser, edited by J. Zinsser, 115–200. Chicago & London: The University of Chicago Press.
- Wolff, Christian. 1720. *Vernünfftige Gedanken von Gott, der Welt und der Seele des Menschen, Auch allen Dingen überhaupt*. [Reasonable Thoughts on God, the Earth and the Soul of the Human Being. Furthermore of all things] Halle: Regnerischer Buchhandel. Reprint: Universitäts- und Landesbibliothek Sachsen-Anhalt.

### Secondary Sources

- Barber, William H. 1967. "Mme du Châtelet and Leibnizianism: the genesis of the In-stitutions de physique." In *The Age of Enlightenment: Studies Presented to Theodore Besterman*, by J.H. Brumfitt, R.A. Leigh, R. Shackelton, and S.S.B. Taylor W.H. Barber. Edinburgh.
- Brading, Katherine. 2019. *Émilie Du Châtelet and the Foundations of Physical Science*. New York/London: Routledge. DOI: <https://doi.org/10.4324/9780429435171>
- Carus, Clara. 2022. "Du Châtelet's Contribution to the Concept of Time. History of Philosophy between Leibniz and Kant." In *Époque Émilienne*, by Ruth Hagen-gruber, 113–28. Dordrecht: Springer. DOI: [https://doi.org/10.1007/978-3-030-89921-9\\_5](https://doi.org/10.1007/978-3-030-89921-9_5)
- Carus, Clara. 2024. "Émilie Du Châtelet's Theory of Simple Beings." *Journal for the History of Women Philosophers and Scientists* 3. DOI: <https://doi.org/10.1163/2666318X-bja00022>
- Carus, Clara. forthcoming. "Comparing Du Châtelet's and Kant's Epistemological Ap-proach to Space and Time." In *Copernican Turns. Émilie Du Châtelet and Kant*, by Ruth Hagen-gruber and Aaron Wells. Dordrecht: Springer.
- Detlefsen, Karen. 2019. "Du Châtelet and Descartes on the Roles of Hypothesis and Metaphysics in Natural Philosophy." In *Feminism and the History of Philosophy*.



- The Recovery and Evaluation of Women's Philosophical Thought*, by Eileen O'Neill and Marcy Lascano, 97–127. USA: Springer. DOI: [https://doi.org/10.1007/978-3-030-18118-5\\_5](https://doi.org/10.1007/978-3-030-18118-5_5)
- Gardiner Janik, Linda. 1982. "Searching for the Metaphysics of Science. The Structure and Composition of Madame Du Châtelet's *Institutions de physique*, 1737–1740." *Studies on Voltaire and the Eighteenth Century* 201: 85–113.
- Hagengruber, Ruth. 2022. "Du Châtelet and Kant. Claiming the Renewal of Philosophy." In *Époque Émilienne*, by Ruth Hagengruber, 75–84. Dordrecht: Springer. DOI: [https://doi.org/10.1007/978-3-030-89921-9\\_3](https://doi.org/10.1007/978-3-030-89921-9_3)
- Hecht, Hartmut. 2012. "In the Spirit of Leibniz – Two Approaches from 1742." In *Émilie du Châtelet between Leibniz and Newton*, by Ruth Hagengruber, 61–76. Dordrecht/New York: Springer. DOI: [https://doi.org/10.1007/978-94-007-2093-0\\_2](https://doi.org/10.1007/978-94-007-2093-0_2)
- Hecht, Hartmut. 2022. "The French Newtonians and their Leibnizian Background." In *Époque Émilienne*, by Ruth Hagengruber, 175–96. Dordrecht: Springer. DOI: [https://doi.org/10.1007/978-3-030-89921-9\\_8](https://doi.org/10.1007/978-3-030-89921-9_8)
- Hutton, Sarah. 2004. "Émilie du Châtelet's *Institutions de physique* as a document in the history of French Newtonianism." *Studies in History and Philosophy of Science* 35: 515–31. DOI: <https://doi.org/10.1016/j.shpsa.2004.06.005>
- Iltis, Carolyn. 1977. "Madame du Châtelet's Metaphysics and Mechanics." *Studies in history and philosophy of science* 8 (1): 29–48. DOI: [https://doi.org/10.1016/0039-3681\(77\)90017-6](https://doi.org/10.1016/0039-3681(77)90017-6)
- Jacobs, Caspar. 2020. "Du Châtelet: Idealist About Extension, Bodies and Space." *Studies in History and Philosophy of Science* 66–74. DOI: <https://doi.org/10.1016/j.shpsa.2020.01.005>
- Janiak, Andrew. 2018. "Émilie Du Châtelet: Physics, Metaphysics and the Case of Gravity." In *Metaphysics of Science II*, by Emily Thomas, 49–71. Cambridge: Cambridge University Press. DOI: <https://doi.org/10.1017/9781316827192.004>
- Lin, Qiu. forthcoming. "Du Châtelet on the Notion of Extension." In *Émilie Du Châtelet in Relation to Leibniz and Wolff. Similarities and Differences*, by Clara Carus and Jeffrey McDonough. Dordrecht: Springer.
- Lyssy, Ansgar. 2022. "Leibnizian Causes in a Newtonian World—Émilie Du Châtelet on Causation." In *Epoche Emilienne*, by Ruth Hagengruber, 197–218. Dordrecht: Springer. DOI: [https://doi.org/10.1007/978-3-030-89921-9\\_9](https://doi.org/10.1007/978-3-030-89921-9_9)
- Paganini, Gianni. 2022. "Émilie Du Châtelet's Epistemology of Hypotheses." In *Époque Émilienne*, by Ruth Hagengruber, 21–54. Cham: Springer. DOI: [https://doi.org/10.1007/978-3-030-89921-9\\_2](https://doi.org/10.1007/978-3-030-89921-9_2)
- Rey, Anne-Lise. 2017. "La Minerve vient de faire sa physique." *Philosophiques* 44 (2): 233–53. DOI: <https://doi.org/10.7202/1042332ar>
- Rey, Anne-Lise. 2019. "Der Streit um die lebendigen Kräfte in Du Châtelets *Institutions de physique*: Leibniz, Wolff und König." In *Émilie du Châtelet und die deutsche Aufklärung*, by Ruth Hagengruber and Hartmut Hecht, 27–64. Wiesbaden: Springer. DOI: [https://doi.org/10.1007/978-3-658-14022-9\\_2](https://doi.org/10.1007/978-3-658-14022-9_2)
- Sidzinska, Maja. 2024. "Émilie du Châtelet's Mathematical Fictionalism." In *New Voices on Women in the History of Philosophy*, by Clara Carus. Dordrecht: Springer.
- Slavov, Matias. 2020. "Universal Gravitation and the (Un)Intelligibility of Natural Philosophy." *Pacific Philosophical Quarterly* 101 (1): 129–57. DOI: <https://doi.org/10.1111/papq.12300>



- Stan, Marius. 2018. "Émilie du Châtelet's Metaphysics of Substance." *Journal of the History of Philosophy* 56 (3): 477–96. DOI: <https://doi.org/10.1353/hph.2018.0048>
- Wells, Aaron. 2021a. "Du Châtelet on Sufficient Reason and Empirical Explanation." *The Southern Journal of Philosophy* 59 (4): 629–55. DOI: <https://doi.org/10.1111/sjp.12433>
- Wells, Aaron. 2021b. "Du Châtelet on the Need for Mathematics in Physics." *Philosophy of Science* 88 (5): 1137–48. DOI: <https://doi.org/10.1086/714874>

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