

Chapter 5

Du Châtelet's Contribution to the Concept of Time. History of Philosophy Between Leibniz and Kant



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Abstract I investigate Du Châtelet's contribution to the concept of time and position the relevance and content of that contribution between Leibniz and Kant. I argue that Du Châtelet advances Leibniz's concept of time by explaining how we form the idea of time in our mind and how time as an ideal being relates to succession in real beings. I show that Du Châtelet, differently to Kant, recognizes the dependency of time in its constitution on succession in "real things" and that her concept of time is in this respect superior to Kant's. With a detailed investigation into Du Châtelet's notion of time in its own right and without prematurely "fitting" it into a defined debate between her contemporaries, I am aiming to reveal her original contribution to an understanding of time. I locate her concept of time in a context that is explicitly philosophical in terms of an investigation into how the idea of time is formed and constituted rather than a physical debate on the nature of time as a phenomenon relating to the movement of bodies.

Until now, Du Châtelet's thoughts on time (as well as other concepts, such as space and force) have mostly been investigated from a historical point of view, i.e. positioning her works between Leibniz, Newton, and further contemporaries. Considering the current state-of-the-art on Du Châtelet and following a 300 year-long neglect for her writings and our resulting picture of Early Modern Philosophy a focus on her novel contributions to the debates of her time is rather pressing. An historical approach concerned with relating Du Châtelet's work to well-known authors without thoroughly investigating her contributions in their own right harbors the danger of belatedly adding her thought as an "in-between" of already defined debates. Without intent, scholarship is thus in danger of reducing Du Châtelet to a commentator on the debates of her time, which does not do justice to the originality of her philosophical work. Simultaneously, it is important to recognize the influence Du Châtelet had on the history of philosophy and to not isolate her influential ideas.

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The following paper is thus dedicated to outlining Du Châtelet's novel concept of time and simultaneously aims to position her concept of time in the history of philosophy between Leibniz and Kant. In what follows, I will show how Du Châtelet's thoughts on time led from a notion of time gained through an observation of change in nature, as found in Leibniz, towards an idea of time within a theory of knowledge, as later developed by Kant. I am aiming to show that her explanation of our notion of time contains a highly significant scientific insight that goes deeper than the explanation of time given by Leibniz. I am also going to show how Du Châtelet's theory of time, on the one hand, prepares us for Kant's concept of time, and on the other hand, will point out an aspect of her theory, which relates the constitution of time directly to *real things*,¹ where we can definitively state that Du Châtelet's theory of time is in this sense superior to Kant's. By doing so, I hope to do my part in establishing Du Châtelet's place in the history of philosophy on time and thereby paint a new picture of this debate.

This paper is sectioned into four parts. In the first part, I address Leibniz's theory of time, which in its argumentative structure is limited to drawing on his theological argument and the Principle of Sufficient Reason. In the second most substantial part, I present Du Châtelet's explication of the constitution of time, i.e. her in-depth analysis of time by *analysis of our ideas in their relation to appearances*. I will show with Du Châtelet in what way time is *subjective* and in what way it is *objective*. In the third part, I will outline the aspects in Du Châtelet's concept of time that express a pre-dated Kantian conception of time and draw on an aspect of her depiction of time, mentioned above, that goes towards explaining its relation to sense-beings and indeed its constitution. I then conclude by addressing this essence of time in my own short critique.

5.1 Time in Leibniz

Time in Leibniz is famously discussed in his correspondence with the British Newtonian Samuel Clarke in the past 2 years of Leibniz's life, 1715 and 1716. The other longer deliberation on time in Leibniz is to be found in the *New Essays on Human Understanding*, completed in 1704. In the latter he deals with time predominantly in the context of his notion of eternity and infinity, a subject matter I will not comment on more deeply since I wish here to focus on the constitution of time itself in Leibniz and its influence on Du Châtelet. In order to pinpoint Du Châtelet's own development of the concept of time following on from Leibniz, Leibniz's correspondence with Clarke is of the greatest importance, not least due to the fact that Du Châtelet read this correspondence and refers to it in her own explanation of time (Inst1742 6.96).² Yet in order to gain a more comprehensive picture of Leibniz's account of

¹ This is Du Châtelet's terminology.

² With a view to scholarship which positions Du Châtelet in the Leibniz-Clarke correspondence within the context of the debate between Newton/Newtonianism and Leibniz/Leibnizianism and

time, I also took the *New Essays on Human Understanding* as well as a shorter piece of writing on the *Metaphysical Foundations of Mathematics* into consideration. The latter manuscript, in which he comments on his conception of time in light of Wolff's mathematical foundations, was written near the end of his life, most likely shortly before or at the same time as the correspondence he led with Clarke.

The discussion on space and time with Clarke arises from the fact that Clarke was a defender of Newton's absolute space, a position Leibniz rejected. Accordingly, time in this correspondence, as in most philosophical investigations up to that point (as well as in Leibniz's other writings) is mainly discussed in its relation to and equivalence with space. Leibniz's main position on space and time against Clarke is that time and space are not "real" or "absolute" beings. They are not substances. The justification for this statement can be broken down into two arguments in Leibniz: one is a *theological concern* and the other based on the *Principle of Sufficient Reason*. The first argument Leibniz puts forward for why space is not a real being is that if there was real absolute space it would be eternal and infinite. This is the argument based on a theological concern mentioned above. Leibniz explains:

These gentlemen maintain therefore, that space is a real absolute being. But this involves them in great difficulties; for such a being must needs be eternal and infinite. Hence some have believed it to be God himself, or, one of his attributes, his immensity. But since space consists of parts, it is not a thing which can belong to God. (Alexander, 25).

As we can see here, Leibniz states that the assumption of space being a real absolute being would have us believe that space is a real eternal and infinite being and thus in some ways equivalent to God. Yet space and God cannot be identical, according to Leibniz, since space has parts while God cannot be regarded as having parts. The same can be argued for time. Furthermore, Leibniz argues that eternity is an attribute that belongs exclusively to God. And since we imagine space (and time) to be infinite, their reality would make them into (real) eternal beings like God. The only solution for avoiding this contradiction is, according to Leibniz, that space and time are not real beings.

The second argument for why space and time cannot be real beings is also to be found in the third letter. Leibniz argues, in response to Clarke, and based on the Principle of Sufficient Reason, that if space and time were real or independent beings God could have created the world in a different space or a year earlier. He writes:

The case is the same with respect to time. Supposing anyone should ask, why God did not create every thing a year sooner; and the same person should infer from thence, that God has done something, concerning which 'tis not possible there should be a reason, why he did it so, and not otherwise: the answer is, that his inference would be right, if time was any thing distinct from things existing in time. (Alexander, 26f).

In other words, Leibniz states that the answer to the question "Why did God create the world when and where he did?" would have to be that there is *no reason*

with regard to her relationship to Clarke from a historical point of view, see Hutton (2011). Hutton points to the fact that Du Châtelet placed much less emphasis on her theological argument on space and time in her 1742 edition of the *Institutions de Physique* than in her earlier edition of 1740, cp. Hutton (2011, 92).

for choosing the particular point in time and space for creation that he chose. Yet he rejects the possibility of God choosing something for no reason by upholding his most fundamental principle, the Principle of Sufficient Reason, according to which nothing can happen without a reason. Since the *inference* of there being no reason is in itself correct, the very question must thus be illegitimate. If time and space are nothing distinct from creation, the question of “when” and “where” can only be posed *within* creation and not concerning creation as a whole. As outlined, the line of argumentation is thus: if space and time were real beings God would have created the world when and where he did without a reason. Since this cannot be the case, Leibniz concludes that the opposite must be true and that time and space cannot be real beings. If time is not a real being, but dependent on creation itself, then time only begins with creation and we cannot think an earlier or later of creation.³

Yet, both justifications for the assumption that space and time are not real beings contain something unsatisfying. Firstly, both are mere negatory and mediate explanations as to why time and space cannot be real beings; rather than explanations for what they are and what makes them what they are intrinsically. Furthermore, the first argument is based on a theological dogma of the existence of God and the impossibility of an identity of a natural being with attributes of God. The second argument is based on the Principle of Sufficient Reason, the validity of which is open for further debate in the given context, especially if we wish to apply it beyond the realm of cognition related to the senses, should our causal thinking be restricted to that realm, as Kant maintains in the First Critique.⁴

But what can we derive from Leibniz’s argumentation that space and time are not real beings for the purposes of a positive explanation of the concept of time itself, i.e. that goes beyond an explanation of what they are not? Leibniz states: Time and space are nothing but “orders of things” (Leibniz, 1998, 39). Furthermore, while space is an order of coexistences, time is an order of successions (Leibniz, 1998, 25f). Leibniz’s point is that time is not a thing distinct from things existing in time or events occurring in time. Rather, it is an “abstract system [...] of relation [...]” (McDonough, 2014, Sect. 5). Times, according to Leibniz, “consist only in the successive order of things” (Leibniz, 1998, 27), i.e. are dependent on real beings which succeed each other, yet time itself is an abstraction. For Leibniz, the fact that time (and space) are “mere abstractions” is characterized by the fact that they are uniform. Substances (and monads), which are real beings on the other hand, are such

³ A very clear explanation of Leibniz’s defense against the Newtonian position on absolute space and time, of his theological argument as well as his argument based on the Principle of Sufficient Reason is to be found in Jeffrey McDonough (2014). McDonough’s elucidation also includes Leibniz’s defense based on the Principle of Indiscernibles, which I have left out here, since it pertains more to space than to time.

⁴ Du Châtelet adopts the Principle of Sufficient Reason as well as the argument that time cannot share a quality with God. Thus, it is not surprising that she too argues that time is not a real being by repeating Leibniz’s two justifications for this assumption at the beginning of her chapter on time. Yet, following this brief introduction, which reads like a summary of Leibniz’s argument, she states that we can also conclude that time is not a real being by an *analysis of our idea of time*. This is an entirely new method for showing what time is and why time is not a *real being*. But I will come back to this in the second section.

that they differ from each other, differ in how they relate to everything else and in what they are by their intrinsic nature.⁵ He writes:

Things that are uniform, containing no variety, are always mere abstractions: for instance, time, space and the other entities of pure mathematics. There is no body whose parts are at rest, and no substance that doesn't have something distinguishing it from every other. Human souls differ not only from non-human ones but also from one another. And I think I can demonstrate that every substantial thing, whether a soul or a body, differs from every other substantial thing in respect of how it relates to everything else, and also in respect of its intrinsic (non-relational) nature. (Leibniz, 1996, 35).⁶

Yet while Leibniz explains that abstractions like time are uniform and thus describes the abstract idea of time he does not explain how this abstraction comes about and thus how the notion of time is constituted. Leibniz's explanation of time as an order of things thus remains restricted to the claim *that* time (and space) are mere abstractions (derived from a predication of uniformity), while Du Châtelet, as we will see, gives an explanation of how the notion of time is constituted within the cognizant subject with a view to the object in time. In Leibniz, we do not discover how the abstraction "time" comes about—Du Châtelet, on the other hand, goes on to explain the constitution and process of the abstraction.

The final point we will turn to in Leibniz's discussion of time is the idea that time and space are nothing but the order of successive things, and of co-existing things respectively, which raises the question of whether space and time are dependent on the *situation of bodies*. The problem arises owing to the fact that Leibniz argues that time and space are nothing without the things or events in them. Clarke objects that time and space are dependent on the particular layout of bodies and events, which he states would be the logical consequence of Leibniz's view; according to Clarke, time flows uniformly and seems not to depend on the particular layout of bodies. Leibniz replies that time and space do not "depend" on the particular layout of bodies, but instead are the order which makes it possible for things to be situated and to be ordered in succession. He writes:

The author [Clarke] contends, that space does not depend upon the situation of bodies. I answer: 'tis true, it does not depend upon such or such a situation of bodies; but it is that

⁵ On the relationship of space and time to Leibniz's monads in his mature metaphysics see Jeffrey McDonough (2014). He writes: "[...] space and time as "beings of reason" are in a sense at least two steps removed from the monads of his [Leibniz's] mature metaphysics. (i) Although bodies may be held to stand in spatial and temporal relations to one another, Leibniz claims, space and time themselves must be considered abstractions or idealizations with respect to those relations. For while relations between bodies and events are necessarily variable and changing, the relations constituting space and time must be viewed as determinate, fixed, and ideal. (ii) As we have briefly noted, however, according to Leibniz's most mature metaphysics, physical bodies and events are themselves to be understood as merely well-founded phenomena. Relations of relative distance and duration holding between bodies must therefore themselves be a step removed from monadic reality, and thus space and time must be, as it were, a second step removed from the most basic non-relational entities of Leibniz's most mature metaphysics". McDonough (2014, Sect. 5.2).

⁶ The argument is based on Leibniz's Principle of the Identity of Indiscernibles, which is one of Leibniz's most fundamental ontological principles and is also known as the "Leibniz law". In short, it states that there cannot be two separate things which have all their properties in common.

order, which renders bodies capable of being situated, and by which they have a situation among themselves when they exist together; as time is that order, with respect to their successive position. (Leibniz, 1998, 42).

Although it is clear here that the order, time and space, is the condition for things to be ordered in a timely or spatial manner, Leibniz does not go deeper in to how it is possible to think that time is (1) dependent upon succession in things but is (2) the condition for things being successive. This is one of the crux elements responsible for the fact that Leibniz's argument against Clarke was often considered unsuccessful in the history of physics. It is also a crossroad where physics and philosophy depart in their explanation of time; philosophy positing time as something somehow independent of bodies (wherein the relationship to bodies has to now be explained). This makes it all the more interesting that we will discover a philosophical answer to this problem in Du Châtelet.

We can summarize that time in Leibniz is: (1) dependent upon real beings, yet not on their particular determination; (2) a mere order of successive beings and (3) an abstraction. Yet the reasoning behind his position is not based on an analysis of the genesis of time itself but on extrinsic arguments of (a) the theological argument concerned with the compatibility of the idea of space and time with God or (b) the Principle of Sufficient Reason.

5.2 Du Châtelet's Concept of Time

With her concept of time, Du Châtelet takes up the heated debate between Leibniz and Clarke, wherein Clarke represents a Newtonian perspective. She follows Leibniz in his idea that time is a mere order of successive things. However, if we look more closely at Leibniz's and Du Châtelet's explanation of how this order arises, we discover that they take very different routes towards their conclusion.⁷ Du Châtelet establishes a more advanced conception of time, which does not rely on the Principle of Sufficient Reason and a theological argument, as Leibniz's does. On the contrary, she shows how time must necessarily be thought and in what way time is constituted in our mind [esprit].⁸ She gives an answer that is evidence of a pre-dated explanation

⁷ In the chapter on space, which simultaneously serves as an introduction to space and time, Du Châtelet clearly positions herself on Leibniz's side having summarized the historical dispute on space and time and their ideality/reality (Inst1740eZ 5.74). The line of argumentation departs from Leibniz's Principle of Sufficient Reason but then moves on to an 'analysis of our ideas'. The clear accord with Leibniz should not be misread as a mere repetition of Leibniz's works. Du Châtelet's elucidation of time, in fact, continues on a very different path to that of Leibniz himself, while the emphasis on this being her own position remains subtle. Hecht (2019, 11) also emphasizes that Du Châtelet's critique of Leibniz (or in this case the separation in the line of argumentation) remains subtle. Reichenberger (2011, 162f.) and Suisky (2011, 124–126) contend similarly that Du Châtelet comments on Leibniz's statements in a way that changes their original meaning, while it is clear that the cause is not a misunderstanding, but a subtle distinction in her own standpoint.

⁸ Reichenberger (2016) discusses Du Châtelet's concepts of time and space in the context of the law of inertia. She draws attention to the fact that a detailed investigation of the relationship of Du

of what Kant will come to determine as succession itself and depict by a line drawn in our mind: in fact, this determination of time is the example Du Châtelet advances, but importantly Du Châtelet shows in a more convincing fashion that time is also constituted through an *object that exists in a timely manner, i.e. a being which alters and serves as a precondition for succession or a being that itself exists in a sequence of succession*. Her conception thus uniquely grasps the simultaneous subjective and objective constitution of time.

The investigation into what we necessarily think when we think of time is achieved by her method: an analysis of our idea of time (Inst1740eZ 6.96).⁹ We discover, by her *theoretical determination of an object existing in time*, what we always imply when we think of time. Du Châtelet's investigation into time is thus philosophical, contrary to her more empirical examinations of nature, such as physical laws, like attraction. Time determines experience per se—it is something which makes the experience what it is and is thus a necessary truth in Du Châtelet, not a contingent one.¹⁰

Du Châtelet begins her discourse on time by stating, as Leibniz did, that time is an order: an order of successive beings. Does this mean that time is simply given by an observation of change in material bodies, one following on from another? In Leibniz, we could still have believed that. In the *Metaphysical Foundations of Mathematics* Leibniz writes: "Time is the order of existence of those things which are not simultaneous. Thus, time is the universal order of changes when we do not take into consideration the particular kinds of change (Leibniz, 1969, 666)". But in Du Châtelet (Inst1740eZ 6.94) the formulation is: "In time [one considers] the order of successive things, insofar as they succeed each other, discounting any other internal quality than simple succession".¹¹ Instead of change, Du Châtelet speaks

Châtelet's concepts of space and time to the *Living forces* debate is yet to be undertaken and is an important desideratum in scholarship on Du Châtelet. Nevertheless, it will become clear in the following article that Du Châtelet's concept of time is not merely of interest in view of her concept of force and within her theory of mechanics, but rather is of philosophical interest in its own right, independent of physical debates relating to it.

⁹ Du Châtelet does not reflect on the method she uses to determine time independently of her investigation of time. Yet her method is clearly indicated by her statement "[...] we are going to see, by the analysis of our ideas, that time is only an abstract being [...]" Inst1740eZ 6.96 as well as "when we pay attention to the links between our ideas, we grasp that in the abstract notion of time the mind only considers beings in general [...]" Inst1740eZ, 6.98, emphasis added.

¹⁰ Du Châtelet adheres to the distinction made between contingent and necessary truths by Leibniz. Yet she determines that contingency is given "when a thing can exist in various ways", as opposed to necessary truths, which can only be determined in a single way. See Inst1740eZ 1.7.

¹¹ The passage in the original French 1740 is: "Dans la durée [on confidère simplement] l'ordre des choses successives, entant qu'elles se succèdent, en faisant abstraction de toute autre qualité interne que la simple succession" (Inst1740). Du Châtelet uses the word "choses" in this context. It is translated as "beings" by Bour and Zinsser, since it is used equivalently with "etres" by Du Châtelet. Yet, the translation does not reflect the ambiguity in Du Châtelet's choice of terms. The simultaneous use of "choses" and "etres" might point to the fact that Du Châtelet is thinking in both cases of something unspecified—something only determined by virtue of its successive character. This is also in line with the fact that "choses" or "etres" seem to encompass the succession of material bodies as well as of ideas (cp. Inst1740eZ 6.108). The terminology is relevant since it

of succession and we will come to see that succession is not merely material nor a simple abstraction from particulars in sensually perceived change.¹² Differently to Leibniz, Du Châtelet explicates, by analysis of our ideas, how we form this order of successive things in our mind. She writes:

When we pay attention to the continuous succession of several beings, and we conceive of the existence of the first A as distinct from that of the second B, and this second B distinct from that of the third C, and so on, and we observe that two never exist together; but that A having ceased to exist, B soon succeeds it; that B, having ceased, C, succeeds it, and, we form a notion of a being we call time. And insofar as we construe the permanent existence of one being in terms of these successive beings, we say that it lasted a certain time, insofar as this being is conceived of as existing with several others that succeed each other. (Inst1740eZ 6.97).

It is important to realize here, that time comes about by an activity of the subject that construes an abstraction based on the alteration of beings. There is a surprising element in this explanation of how the abstraction, time, is constituted: Du Châtelet explains that the idea of the permanence of any being or of its lasting, its duration, only comes about by virtue of our comparing it to successive beings. In other words, the permanence or duration of a thing is based on the idea of time gained from the succession. We can see that this is true when we consider that we cannot have an idea of the duration of anything without comparing it to something else, namely the duration of another thing existing. We can only say that Simon lived 101 years because we compare his lifetime with the movement of the sun and can only say that the birch tree's leaves die in winter because we compare it to the change of the seasons.

This notion of time constituted by comparing and relating the existence of successive things to each other is, as Du Châtelet points out our original notion of time. This notion of time is prior to the measurement of time in relation to a clock, the year, etc. The distinction between our original notion of time and the measurement of time or "portions of time" is important, as it sheds light on what it means, for Du Châtelet, to say that time is an ideal not a real being, and in what way time is an order of things. An investigation into this distinction also makes clear that Du Châtelet is clear about the fact that time as an abstract and ideal being is dependent upon alteration in real "beings" or "things". Yet it remains unclear for her whether those real beings or things are material and thus have to be perceived sensually. As a consequence, it is unclear whether time is dependent upon a sensually perceived change in material bodies or how else succession in our ideas can come about. Let us delve into this further.

We have, as Du Châtelet explains, an idea of time without a measurement of time. The measurement of time is merely a derived notion of time, created in order to communicate portions of time in relation to each other and to objectivize for

leaves a certain ambiguity in Du Châtelet's concept of time as to what extent 'etres' are material or sensual.

¹² Leibniz also uses the term succession in the context of time (e.g. in Leibniz 1998, 42) but the concept of succession is not the subject of further investigation, as is the case for Du Châtelet.

ourselves and others those portions of time. Du Châtelet contends that, while we do have an (inner) idea of time, simply by means of our ideas succeeding one another and the possibility of relating the succession of those ideas to each other, *portions of time* and thus an objective measurement of time can only be determined by changes in exterior bodies.¹³ Our *measurement* of time is thus dependent on alteration or change in exterior bodies, while the constitution of the notion of time itself is merely dependent on succession, which is given in the succession of ideas.¹⁴ Exterior bodies, in turn, are understood as timely in terms of their being represented by successive ideas:

We have seen that the successive existence of beings gives rise to the notion of time; now, as it is our ideas that represent to us these beings, the notion of time is born from the succession of our ideas and not from the movement of exterior bodies; for we would have a notion of time even if nothing other than our soul existed, and insofar as things that exist outside of us are similar to the ideas our soul creates of them, they exist in time. (Inst1740eZ 6.108).

It thus becomes clear that time is an abstraction and an ideal being since it is constituted by virtue of our soul relating successive ideas to each other, while the succession of ideas represents external bodies.¹⁵ Time as an ideal being does not come about by a mere abstraction from the particular in the change of material bodies, but by relating successive ideas to each other and abstracting from their particular content—a relation which is constituted by the mind. Yet although in the above quote she seems to argue for a pure ideal existence of time, Du Châtelet also makes clear that successive existence and therefore actual time is dependent on actual existing beings, beings which exist in a successive manner. Du Châtelet puts forward the convincing fact that we cannot think a part of time without a content:

One can accept as actual parts of time only those denoted by actually existing beings; for actual time being only a successive order in a continuous sequence, one can accept portions of time only insofar as real things have existed and ceased to exist. For successive existence makes time, and a being that coexists with the least possible change in nature has lasted the shortest actual time; and the least changes, as for example, the movements of the smallest animals, denote the smallest actual parts of time we can perceive. (Inst1740eZ 6.105).

Du Châtelet goes on to say that the very constitution of time is dependent on the successive nature of ideas in correlation with what they represent, i.e. change. By virtue of Du Châtelet's explanation, that time comes about through *relating* and *comparing* the existence of successive beings we can understand her classification of actual time as an exterior relationship. Du Châtelet writes:

¹³ Du Châtelet explains in this context that there is no exact or universal measurement of time apart from the instant (Inst1740eZ 6.114). Hecht (2019, 22) interestingly points out the value of Du Châtelet's discovery of this universal measurement of "an instant" for the concept of force.

¹⁴ What can be derived from this is that time, as a conceptual notion, comes about through our mind, which is a separate power to that which is represented in our mind and when both these elements are taken together this constitutes a consciousness of something in time.

¹⁵ As can be seen from the above quote, Du Châtelet is in no doubt about the fact that successive existence of beings is necessary for our notion of time, i.e. that there has to be a successive content. Yet it is not clear whether that succession in our ideas is, for this content, at bottom dependent on external bodies.

Thus, the time is not actual in the things that last, but is a simple mode or exterior relationship, which depends only on the mind insofar as it compares the duration of beings with the movement of the sun, and of the other exterior bodies, or with the succession of our ideas. (Inst1740eZ 6.97).

Hence, the actual time is dependent on the comparison of the succession of things, i.e. on us putting them into a relationship. But this is also to say that the objectivity of Simon's 101 years is not in Simon, taken by himself, but only comes about by comparing Simon's duration with things succeeding, while he exists. This conversely also implies that we can only understand things that alter or change through our notion of time. The order of succeeding things, time, is dependent on our mind, insofar as it is necessary to create a relationship, a comparison between the succeeding things in order to understand them as timely. Yet the event, alteration or existence of something only becomes understandable as timely by virtue of the relationship to another time-span of existence, the relationship of which is created by our mind in view of something represented by it. The event, alteration, movement or existence is not itself sufficient to constitute our notion of time.

Du Châtelet goes on to explain how the notion of time is constituted in our ideas:

When we pay attention to the links between our ideas, we grasp that in the abstract notion of time the mind only considers beings in general; and that having discounted all the determinations these beings have, one only adds to this general idea, that of their non-co-existence, that is to say that the first and the second cannot exist together but the second immediately succeeds the first, and with no possibility of the existence of another being between the two, discounting here again internal relationships and causes that make them succeed each other. In this manner one creates an ideal being, consisting in a uniform flow, which must be similar in all its parts, since to create it one uses the same abstract notion for each being without determining anything of its nature, and one considers in all these beings only their successive existence without caring about how the existence of one gives birth to the next. (Inst1740eZ 6.98).

In the first instance, I would draw attention to the fact that in order to gain a notion of time we first have to have an idea of beings in general. We strip real beings of all their material, sensual determinations, i.e. abstract from their determinations. We thus have an idea of being left that is not dependent on the sensual determinations themselves. This idea becomes constitutive for time. Secondly, I would draw attention to the fact that this notion of time as created by the mind is an abstraction. Abstraction from everything but mere succession. This is to say that we take beings beginning and ceasing to exist, i.e. alteration or change, and we create mere succession out of this alteration by abstracting from all material determinations as well as the causal relationship between the two states, i.e. we abstract from the internal relationship of one state determining the other. Yet interestingly, every time something changes in nature we make sense of it by assuming a cause—a cause for the leaves having gone red, for the chaos in my room, for the car being damaged. Yet for the constitution of our notion of time, we abstract from those causes as well. The very notion of time in Du Châtelet is thus constituted by taking alteration and abstracting from everything but the succession in it, i.e. abstracting from causes as well as all material determinations. *Since time only refers to alteration and things that alter, time is*

dependent on alteration and the things that alter. Du Châtelet makes very clear that beings beginning and ceasing to exist (this includes qualities and ideas), i.e. alteration, is the condition for succession and thus time. *Importantly, however, Du Châtelet recognizes that time is not given with alteration, although dependent on it.* Time requires the mind to put the successive things into an order by relating them to each other with respect to their succession only. But where do we garner succession from, which is required for time?

Du Châtelet advances that succession is not necessarily motion, i.e. it is not physical per se. Rather, it is the sequence of our ideas which we rely upon when forming the idea of time. She writes:

Movement, by itself, is so far from giving us the idea of duration, as some philosophers have claimed, that we only acquire the idea of movement by our reflection on successive ideas, which the moving body causes in our mind by its successive existence with the different bodies that surround it. (Inst1740eZ 6.108).

In other words, we need to gain the idea of successive existence by means of abstraction,¹⁶ which then makes it possible to compare things according to their successive existence and enables us to understand movement as well as duration. Movement is thus not itself necessary to think time, that is, time in the abstract as succession. Thus, it must be noted that Du Châtelet has a highly specific conception of time, one that is both time as an idea and the timely as that which the idea of time necessarily relates to and along with which it is constituted.

The process of abstraction through which we constitute the notion of time explains how we come to *imagine* time as a being subsisting by itself, i.e. how we come to *postulate* time itself as a real being. Du Châtelet writes:

This abstract being we thus created must appear to us independent of things and subsisting by itself. For since we can distinguish the successive manner for beings to exist, the manner of their internal determinations, and of the causes which gave birth to this succession, we must regard time as a being apart, separate from things and able to subsist without actual and successive things, since we can still think of this successive existence, after having destroyed with our minds all the other realities, that is to say, having discounted them. (Inst1740eZ 6.99).

Du Châtelet explains that this imaginary notion of time that we have and in which we take time in the abstract as a mere continuous succession can be useful in geometry. She makes clear, however, that we should not hold time to *be* this abstract being in metaphysics. In this context, her argument is equivalent to Leibniz's theological argument, namely that by doing so we would make duration an eternal being like God.¹⁷ Yet with regard to Du Châtelet's explanation of the concept of time, the argument for time in the abstract being an imagination, which is not legitimate in metaphysics, rests on the fact that it is clear in Du Châtelet that time is constituted in dependency of real successive things, i.e. that the notion of time is dependent on

¹⁶ Through the power of imagination in the first instance, which she indicates, as we will see in the next paragraph, but does not explicitly expound.

¹⁷ For the statement on geometry, metaphysics and the theological argument see Inst1740eZ 6.101.

objects which are themselves of a successive existence. Yet it is not clear whether Du Châtelet considers time a being without need of sensible qualities in our imagination, i.e. whether the succession itself can be viewed in absence of a representation in the imagination of something with a sensible property.¹⁸ Thus, time is dependent upon successive beings, which are in the *first instance* real beings with alterations, yet it is also an abstraction of the mind in terms of succession being created by the mind. We can certainly state: Time is objective in Du Châtelet in the sense of relating to beings in a sequence of succession and subjective in the sense of being something the subject of representation creates when our mind relates and compares these beings and creates an order. Du Châtelet writes:

So *time* is really nothing other than the order of successive beings; and one forms the *idea of it* inasmuch as one considers only the order of their succession. Thus, there is no time without true successive beings arranged in a continuous sequence; and there is time as soon as such beings exist. (Inst1740eZ 6.102).

We can see from this rich and deep-going citation that Du Châtelet is very clear about the twofold dependency present in our notion of time. Let us conclusively state: In the first instance our notion of time is garnered from its dependency on actual successive beings and this succession comes about through alteration, (i.e. one being beginning and ceasing to exist). But it is, secondly, also dependent upon the subject which abstracts from everything but the succession in those beings, relates their succession to each other and thus brings about an order—time. If we think about this, it would have to follow that what the mind constitutes (i.e. what is not known through the product of the senses themselves) is in what the beings are, insofar as it relates to *their* succession. Yet Du Châtelet addresses the question of our *imagination* of beings and states that we can posit beings succeeding each other and state that this is a construction of time as is evident in the passage (Inst1740eZ 6.108) quoted earlier. It is clear that Du Châtelet does not consider time itself to be an order that can exist for itself through the mind alone without an object that is given, yet she does not make clear whether this order is only truly valid in terms of *the content* of that which actually succeeds, i.e. at bottom exterior bodies. Certainly, when our ideas succeed each other, as we have seen, there is time for Du Châtelet; but is that succession not always essentially sensible? How could the order of time be objective (therefore also with regard to sense-objects) if it is not given in the object's constitution, in something that possesses succession (and with regard to the sense-object therefore through alteration, such that we can say Simon who was 101 lived longer than Susan who lived until she was 82). Du Châtelet does in any case definitively state at the end of the above citation that the order, i.e. time, can only be brought about by the mind because there are real things existing which have in them the possibility of being thought in that order. Du Châtelet is very clear about this subject/object constitution of the notion of time. She writes:

In the same way time, which is nothing other than the order of continuous successions, could not exist if things in a continuous sequence did not exist. Thus, there is time when things

¹⁸ Du Châtelet does however explain that we abstract from “particulars” and thereby create the idea of time as an abstraction, Inst1740eZ 6.100.

are, it is removed when one removes these things; however, it is like the number, different from the things that succeed each other in a continuous sequence. (Inst1740eZ 6.103).

Her investigation into the concept of time is thus exemplary in being clear that a content needs to be represented in time, yet it remains unclear whether the “real being” she refers to is in fact only “in time” when it is something that succeeds by virtue of itself, i.e. at bottom a sense-being, or whether a fiction of the imagination could be said to in itself be constitutive for time, which appears to be indicated. Either way, it is an investigation which clearly straddles the borders between rationalism and empiricism,¹⁹ between an adherence to universal principles as well as to experience as their link to the sense-world, making her a predecessor of Immanuel Kant.

5.3 Du Châtelet's Concept of Time in Relation to Kant's

To conclude the examination of Du Châtelet's contribution to the concept of time, I will briefly remark on the relationship of Du Châtelet's work on time to Kant.²⁰ Kant famously recognized time as a form of intuition, yet we can see in Du Châtelet that she already had a conception of time as an order of successive beings, which, however, stands in direct relation to the objects of sensation.²¹ In Kant the form of intuition belongs simply to our disposition (Gemüt) and the transcendental time-determinations, constitutive of our determination of sense-objects, are determined by the categories and thus are a production of the intellect. Du Châtelet recognized that in order to conceive of anything as timely we need to form a notion of time through relation, i.e. by relating successive things, which is, in turn, a production of the mind. The timely exterior things can only be thought as timely because of this

¹⁹ For Du Châtelet's position between rationalism and empiricism and her attempt to “reconcile an empirical and a rationalistic approach”, see Hagengruber (2011a, b, viii) as well as Hagengruber (2016).

²⁰ A lot of work is still to be done with regard to Kant's reception of Du Châtelet. First advancements on the relationship between Du Châtelet and Kant from this historical point of view are to be found in Reichenberger (2019), Ursula Winter (2011) and Winter (2006). Reichenberger (2019) establishes that Kant knew Du Châtelet's works, including her *Foundations of Physics*, and shows how the intellectual circle surrounding the Gottscheds' contributed to his knowledge of Du Châtelet. She argues that Kant's direct reception of Du Châtelet was limited to his debut work *Thoughts on the True Estimation of Living Forces* (cp. Reichenberger 2019). Winter (2019) adds passages from Kant's opus postumum, specifically the volumes XXI and XXII of the Akademie-Ausgabe, to Kant's ruminations on Du Châtelet. In light of this discovery Winter puts into question whether further theories and aspects of Kant's pre-critical period were not in fact in line with Du Châtelet's philosophy. Furthermore, she points out with reference to Mittelstrass (2011) that important works of Leibniz's were not published and accessible to Kant and that Kant thus knew Leibniz through other work. With regard to Kant's early writings, Winter names Wolff, Bilfinger and Du Châtelet as possible reference points for Leibniz's works.

²¹ A textual comparison of Du Châtelet's notion of space and time with Kant's is to be found in Winter (2019). I do not want to delve into similarities and differences in their notions of time in this context. Rather, my aim is to highlight an important aspect in Du Châtelet's notion of time, which is lost to post-Kantian philosophy.

activity of the mind; she thus already recognized what Kant goes on to formulate as the productive form of intuition, time. However, Du Châtelet shows that the notion of time is an abstraction, even if it is created by the mind, which is dependent upon real objects succeeding each other and that time *as a real portion of time* is dependent upon succession and importantly change, which is derived of exterior beings, i.e. sensation.

5.4 Addressing the Problem of Real and Ideal Time

Let me here put forward my understanding of a problem Du Châtelet has addressed above concerning the need for something to be in a successive sequence for there to be time. Although Kant at the end of the Transcendental Aesthetic explicates time in its objective validity through the transcendental method, he does not actually explain how time itself is constituted in view of the sense object. The line Kant uses to depict the a priori character of time, and explain time's constitution, only pertains to explaining succession through the imagination. I assert that the line is an abstract depiction and time is not itself known through the line (AA, B50). Let me explain: Neither the understanding nor the imagination or their correspondence can create *one-after-another-ness* without a specific content and another specific content that follows, since how is one-after-another-ness thinkable without the actual sense object that is altering or changing?²² To then answer: succession is something abstract and not in need of any alteration is to talk of uniform self-created succession, but not time, at the very least, not objective succession since it is created by the subject of that representation of succession alone. We need concrete intuitions that change in order for one-after-another-ness to be something. A pure X that does not entail anything and a pure X that follows does not pertain to two different points in time, as there would be a no different expression between the two Xs. Instead, the X-points would be measures or modes of possibility, rather than actual time or timeliness: time cannot itself be temporal without something that is temporal, i.e. something that qualifies that there is time, i.e. that something has passed or that something has begun. Hence, time is not as Kant states the substratum (AA, B183). It is necessarily based on one-after-another-ness. There is no succession (in nature) without alteration of some kind. Creating two Xs in our imagination that follow on from one another in the imagination can only be created by applying an empty relation between the two that suggests a before and an after. One might object that it is the mind itself that is "creating" the succession, yet the mind is itself unchanging (in the sense of being a faculty) and thus cannot itself be temporal.

Is the claim that time is purely a priori, which overlooks the dependency of the constitution of succession on "real" changing beings, perhaps the reason that time

²² One-after-anotherness is the term I use here to depict the connection between alteration and succession and serves to clarify further why Du Châtelet's depiction of time is accurate. On this theme see Carus (2021).

in Kant can only relate in its objective validity to sense-objects through causality? In other words, that this quality of something being successive actually only finds objective validity (which in turn is alteration) when related to a before and after in relation to each other through the understanding, i.e. cause and effect (AA, B234).

Kant's concept of time is represented through succession in the imagination and applicable to phenomena through causality (AA, B292) but does not in fact grasp time in its necessary relation to sense-being. In Du Châtelet, a clear definition of "real beings", which include ideas, is not given and the relationship between sensual content and real beings is not discussed. Yet in her explanation of time, it becomes clear that we can only think a portion of time by means of an actually existing exterior being, and that beings existing in a successive manner are a precondition for the notion of time. She also explains that the notion of time is constituted by the mind, relating the existence of successive beings to each other, i.e. by the mind being active in creating the idea of time. Her explanation of time in its being constituted through the object and the subject of representation is convincing, as it explains the relationship of time to the mind and the mind's ability to think the timely as something distinct from the un-timely. It also explains the objective sense-relation of time, which we are confronted with when we deal with nature, e.g. cook noodles, as the time they need to soften is specific.

It has been shown that Du Châtelet's concept of time is a significant advancement on Leibniz's concept of time and in one respect superior to Kant's. Her contribution to the subject matter is thus an invaluable insight into the history of philosophy, which has not been recognized in its originality.

Abbreviations

(Inst1740) Du Châtelet, É. 1740. *Institutions de Physique*. Paris: Prault fils.

(Inst1740eZ) Du Châtelet, É. 2009. *Selected Philosophical and Scientific Writings*, translated by I. Bour and J. Zinsser, edited by J. Zinsser, Chicago & London: The University of Chicago Press, 115–200.

(Inst1742) Du Châtelet, É. 1742. *Institutions physiques de madame la marquise Du Chastellet adressés à M. son fils*: Nouvelle édition, corrigée et augmentée considérablement par l'auteur. Amsterdam: Aux dépens de la Compagnie.

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