Against Foundationalism about Persistence-Conditions

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Abstract
In this paper I will argue against a view that I call foundationalism about persistence-conditions. The core of this view is that composite physical objects have their specific persistence-conditions in virtue of these conditions being fulfilled by the object’s physical constituents at various times. I will provide two arguments – the argument from the possibility of instantaneous objects and the argument from the presence of persistence-conditions – which show that this view is untenable. These arguments will also point towards a more adequate understanding of what it means for an object to have certain persistence-conditions. I will expound this understanding and suggest, on its basis, an unorthodox, hylomorphist account of the persistence-conditions of objects.

Keywords: persistence, persistence-conditions, hylomorphism, coincidence of objects

1 Foundationalism about persistence-conditions

To a first approximation, what I call foundationalism about persistence-conditions is the view that any composite physical object has its specific persistence-conditions in virtue of the fact that its physical parts, at the various times of its (the object’s) existence, are related to each other as required by these persistence-conditions. In other words: that an object has its persistence-conditions in virtue of these conditions somehow being fulfilled by its physical constituents.¹

The main aim of the present paper is to show that foundationalism about persistence-conditions is untenable. To this end, I will, in section 2 and 3, present two arguments – the argument from the possibility of instantaneous objects and the argument from the presence of persistence-conditions – which show that this account of how an object gets
its persistence-conditions leads to bizarre or even unacceptable consequences. These arguments, however, will not only reveal the inadequacy of foundationalism about persistence-conditions. They will also point towards a more adequate understanding of what it means for an object to have certain persistence-conditions. In section 4 I will expound this understanding and suggest, on its basis, an unorthodox, hylomorphist account of how an object gets its persistence-conditions.

In the remainder of this section I shall introduce the idea of foundationalism about persistence-conditions. Before I start doing so, however, let me make explicit two assumptions on which I will rely throughout this paper. Firstly, I assume that all composite physical objects have persistence-conditions and that most of them actually persist. This assumption is, inter alia, meant to rule out so-called exdurantism or stage-theory, the view that composite physical objects are (i) instantaneous (i.e. without temporal extension beyond the instant at which they exist) and (ii) always exist at the same instant (i.e. do not ‘move’ through time) (see [14] or [31] for elaborated statements). Let me point out, however, that this exclusion of exdurantism is primarily for simplicities sake. I am confident that almost everything I will say in this paper could be made compatible with exdurantism by being said in some more complicated manner. Secondly, I assume that persistence-conditions are kind-specific, that is, that, for any kind of object K, there are specific persistence-conditions such that any object has to have these persistence-conditions in order to be of kind K (see [21], [35], [37] for arguments for this assumption). So, for something to be, say, a statue means for it, between other things, to have statue-like persistence-conditions. I leave it open whether this is because objects have their persistence-conditions in virtue of their being of certain kinds or because objects are of certain kinds partly in virtue of their having certain persistence-conditions.

An instructive way to introduce foundationalism about persistence-conditions is by presenting it as a way to overcome a now familiar misconception of persistence-conditions. The main source of this misconception seems to be an unfortunate, but still common terminology. Instead of ‘persistence-conditions’ philosophers often talk of ‘conditions or criteria of diachronic identity’. This triggers the impression that what is at issue are necessary and sufficient conditions of an object at one time being identical with an object at another time. Let us call this the identity-conception of persistence-conditions. It is manifest, for example, in the following characterization of the problem of personal identity through time by Richard Swinburne: ‘What are the logically necessary and sufficient conditions for a person $P_2$ at a time $t_2$ to be the same person
as a person $P_1$ at an earlier time $t_1$?" [34, p.223]. As various authors point out, this characterization is defective. For one thing, while there are different kinds of persistence-conditions / conditions of diachronic identity for different kinds of objects, there are not different kinds of identity-relations for different kinds of objects – or so I assume. For another thing, the relation of identity is not only ‘utterly simple and unproblematic’ [21, p.92]: it is the relation in which every entity stands to itself and to nothing else. It is also fundamental, which is to say: Nothing informative can be said about the conditions of its obtaining. (See e.g. [21, p.192f], [25, p.86f] or [27, p.466]). So, if there is any substance to the problem of finding the persistence-conditions / conditions of diachronic identity of certain kinds of objects, which clearly seems to be the case, this problem cannot be understood in the way Swinburne’s formulation suggests: as a problem of giving conditions/criteria of the obtaining of identity.

Beyond this, there is a further, less familiar, problem with Swinburne’s formulation. The formulation strongly suggests that Swinburne starts from the presupposition that, at both times, there is an object of the relevant kind (person, in this case) and then asks under what conditions the object at one time is identical to the object at the other time. In other words: He seems to assume that the question of whether certain persistence-conditions/conditions of diachronic identity are met, arises only under the presupposition that there are, at different times, object(s) of the relevant kind. Such an assumption would commit him to assume that the existence of the relevant object(s) at the relevant times is prior to their fulfilling the relevant persistence-conditions / conditions of diachronic identity. But this can hardly be true. Just think of a possible – even if unlikely – situation in which, by cosmic accident, an intrinsic duplicate of you, at this very moment, suddenly alight from a swamp (see [6]). It seems that, at the moment of its coming into existence, this entity would not be a person because, contrary to you, it would lack the right kind of history. More precisely, it would fail to be a person because it would not stand in what Swinburne calls the relation of diachronic identity to a person at former points of time. If this is true, as I shall assume, it cannot generally be the case that the existence of an object at a time is prior to its fulfillment of its persistence-conditions / the conditions of its diachronic identity.

There is far-reaching agreement that the right way to overcome the erroneous identity-conception of persistence-conditions induced by formulations like Swinburne’s is to understand them not as conditions of the identity of objects of specific kinds, but as part of the conditions of
their existence.\(^7\) (Following this idea, Noonan e.g. proposes to replace, for any kind K, the talk of diachronic identity-criteria of Ks by talk of ‘the diachronic criterion of K-hood’ (see [25, p.91]).) Foundationalism about persistence-conditions is a straightforward and seemingly natural way to work this proposal out. One of its clearest and most elaborated versions is due to David Lewis (see e.g. [19], [20], [21]). He used to present it as applied to the prominent example of persons. After having introduced the term ‘I-relation’ for ‘the relation that holds between the several stages of a single continuant person’ [20, p.21], he states:

‘[…] something is a continuant person if and only if it is a maximal [I]-interrelated aggregate of person-stages. That is: if and only if it is an aggregate of person-stages, each of which is [I]-related to all the rest […] , and it is a proper part of no other such aggregate.’ [20, p.22]

As everyone familiar with Lewis’ ontology of physical objects will realize, when he talks of ‘stages of objects’, he has in mind temporal parts of four-dimensional objects. His idea can be put as follows: All concrete physical objects are aggregates of temporal stages. So, for there to be persons at least one such aggregate has to fulfill the conditions of being a person. These latter conditions incorporate conditions of two kinds. One says how the stages of an object has to be intrinsically: They have to be person-stages. The other says how such person-stages have to be interrelated to each other: They have to be (maximal) I-interrelated. The second kind of conditions are the persistence-conditions of persons. Hence, the persistence-conditions of persons are part and parcel of the conditions of the existence of persons; and analogously for all other kinds of (ordinary) objects.

Now, as e.g. Noonan makes clear, Lewis’ four-dimensional ontology of objects is not mandatory for foundationalism about persistence-conditions. The latter can be maintained under the presupposition of three-dimensionalism as well (see [25, pp.89]). To account for this possibility, let me introduce an explicitly neutral terminology. Let a slice be a portion of matter at a point of time. Such entities are acceptable for both four- and three-dimensionalists. I shall, furthermore, say that a slice constitutes an object at a time iff, at the time, the object occupies exactly the same space as the slice.\(^8\) In this terminology, both a four- and a three-dimensionalist can – and will – say that physical objects are constituted by different slices at different times. Then, the idea of foundationalism about persistence-conditions amounts to this: For any kind K, the conditions of the existence of a K incorporate two kinds
of conditions: (i) conditions on how the slices constituting a K have to be intrinsically: they have to be K-slices; and (ii) conditions on how K-slices have to be interrelated to each other in order to constitute the same K: there is a relation R such that K-slices have to be (maximal) R-interrelated in order to constitute the same K. Conditions (ii) are the persistence-conditions of Ks. Hence, the persistence-conditions of Ks are part and parcel of the conditions of the existence of Ks.

With regards to the issues to be considered in this paper, the crucial aspect of this proposal is the explanation it offers for an object’s having certain persistence-conditions. If the persistence-conditions of an object are part and parcel of the conditions of the object’s existence, an object has its persistence-conditions in the same sense in which it has its existence-conditions. Conditions have to be in force prior to their exemplification. But prior to their exemplification conditions of the existence of objects cannot be ascribed to particular objects. The only objects to which they can be reasonably ascribed are the object’s that come into being in virtue of their fulfillment. So, the only sense in which these objects can be said to have the relevant existence-conditions is that they come into being in virtue of their fulfillment. According to foundationalism about persistence-conditions, the same has to be said about persistence-conditions. That an object has specific persistence-conditions means that it comes into being in virtue of the fulfillment of these persistence-conditions. (See also figure 1 below for an illustration of this idea.) I regard this as the defining feature of foundationalism about persistence-conditions. Accordingly, it will be the leverage point of my arguments against this view.

This being clarified, we should now have a clear idea of how foundationalism about persistence-conditions avoids the pitfalls of the identity-conception of persistence-conditions. Foundationalism about persistence-conditions replaces this misconception by the idea that, instead of being conditions of identity, an object’s persistence-conditions are conditions of the object’s existence. As a consequence, foundationalism about persistence-conditions is free of the problems mentioned above. Recall: The first problem was that, since there are not different kinds of identity, the idea that persistence-conditions are conditions of identity cannot explain why different kinds of objects have different persistence-conditions. No such problem arises for foundationalism about persistence-conditions. Since different kinds of objects have different existence-conditions, the assumption that an object’s persistence-conditions are part of its existence-conditions easily explains why differ-
ent kinds of objects have different persistence-conditions. The second problem was that the conception of persistence-conditions as conditions of identity fails to explain why substantial and informative things can be said about the persistence-conditions of objects. Again, the foundationalist about persistence-conditions has no problems explaining this. According to her, the question of the persistence-conditions of objects of a kind K is the question how K-slices have to be interrelated in order to constitute a K; and this clearly is a substantial issue.

Moreover, at first glance, foundationalism about persistence-conditions also appears promising as a solution of the final problem with the identity-conception of persistence-conditions, the problem of the false presupposition that the existence of object(s) at times is always prior to the question of their fulfilling the relevant persistence-conditions. Since, according to foundationalism about persistence-conditions, the persistence-conditions of objects are part of the existence-conditions of these objects, it cannot be the objects themselves which fulfill these conditions. After all, prior to the fulfillment of the existence-conditions of an object – of which its persistence-conditions are a part, mind you – there just is no object which might fulfill these or any other conditions. The entities on which it is to fulfill an object’s persistence-conditions are, rather, the slices thereby coming to constitute the object. Consequently, according to foundationalism about persistence-conditions, the existence of object(s) at times is not always prior to the question of their fulfilling the relevant persistence-conditions. Quite the contrary, as we saw, foundationalism about persistence-conditions even implies that there can never be an object of a specific kind without its persistence-conditions being fulfilled, that is, being fulfilled by the slices constituting it.

So, foundationalism about persistence-condition is not without its merits. However, the last point already gives us a hint on where it might go wrong. It seems strange to assume that even the coming into existence of an object is a consequence of the fulfillment of its persistence-conditions. Intuitively, persistence-conditions just do not seem to be (parts of) existence-conditions in this sense. Rather, a natural characterization of persistence-conditions seems to be this: They are the conditions under which an already existing object persists (i.e. continues to exist). But if this characterization is along the right lines, an object’s having certain persistence-conditions can hardly be a matter of these conditions being fulfilled. Instead, it would have to be a matter of these condition’s being in force for this object; and the being in force of conditions is, precisely, prior to their fulfillment. The arguments of
sections 2 and 3 are intended to show that this uneasiness with foundationalism about persistence-conditions is perfectly proper and that the alternative conception just indicated is indeed preferable.

For the purpose of presenting these arguments, the following additional bit of terminology will proof helpful: For any object, the temporally first slice constituting this object shall be called its origin and the conditions which make a slice the origin of an object of a kind K shall be called the originating-conditions for Ks. In order not to beg any question, this latter term is to be understood as neutral regarding the question of which kinds of conditions these originating conditions might be. In particular, it allows for the possibility that the originating-conditions for Ks are nothing but the conditions that (i) the relevant slice is, intrinsically, a K-slice and that (ii) it is not related to an earlier slice in the way required by the persistence-conditions for Ks – which is, of course, what a foundationalist about persistence-conditions would say.

2 The Argument from the Possibility of Instantaneous Objects

The first argument is fairly straightforward. Let us call objects that are constituted by just a single slice instantaneous objects. Since persistence requires the existence at more than one point of time, instantaneous objects are objects that do not persist. It is, however, a conceptual truth that, if an object does not persist, its persistence-conditions are not fulfilled. Hence, the single slice constituting an instantaneous object cannot fulfill this object’s persistence-conditions. This raises a problem for foundationalism about persistence-conditions. According to foundationalism about persistence-conditions, objects have persistence-conditions in virtue of these conditions being fulfilled by the slice(s) constituting them. But, as just indicated, the slice constituting an instantaneous object cannot fulfill any persistence-conditions. So, if there were such objects and foundationalism about persistence-conditions were true, these objects would not have any persistence-conditions. This consequence, however, would contradict the two assumptions I made at the beginning of the paper – the assumptions that (i) all objects have persistence-conditions and that (ii) their having the persistence-conditions they have is part of what makes them the kind of objects they are. Hence, if these assumptions are indeed true – what I assume (but see below) –, the foundationalist about persistence-conditions has to deny the possibility
of instantaneous objects. In other words: According to foundationalism about persistence-conditions, the fact that a single slice meets the originating-conditions for a certain kind of object is not sufficient for there to be an object of the relevant kind with the persistence-conditions of the relevant kind. For the latter to be the case, there has to be at least one further slice being related to this slice as required by these persistence-conditions.

But things do not seem to be this way. It seems absurd to assume that, for any kind of object, there could not be objects of this kind (i.e. objects with the persistence-conditions specific for this kind) which do not exist long enough for their persistence-conditions to be fulfilled. The more reasonable assumption is that, for all (most, some...) kinds of objects, it is sufficient for there to be an object of the relevant kind (i.e. an object with the persistence-conditions specific for this kind) if a slice meets the originating-conditions for this kind of objects.

To make the point more vivid, consider the following pair of cases:

**Case 1:** An artist arranges particles of a suitable kind in a way such that a slice at a point of time $t_1$ meets the originating-conditions for statues. The slices at the later points of time $t_2 \ldots t_n$ are related to this slice in the way required by the persistence-conditions of statues. For short: The slice at $t_1$ is the origin of a statue which continues to exist until $t_n$.

**Case 2:** At and up to $t_1$, everything is as in Case 1. But in the very next moment (i.e. before a slice takes place which fulfills the persistence-conditions of statues) God intervenes and destroys the arrangement of particles.

Since nothing can be a statue without having the persistence-conditions of statues, foundationalists about persistence-conditions are committed to deny that the artist in Case 2 succeeds in creating a statue. Due to god’s intervention, the would-be statue does not exist long enough for the persistence-conditions of statues to be fulfilled. This conclusion, however, seems plain wrong. The right thing to say seems to be that, in Case 2, there is a statue, but one that exists for only one moment (i.e. an instantaneous statue). Any view incompatible with this should be avoided.

Well, as it stands, this argument might look suspiciously simple. So, let us see whether there are any reasonable objections a foundationalist
about persistence-conditions might raise against it? I take it that the fact that, given my initial assumptions, foundationalism about persistence-conditions is incompatible with the possibility of instantaneous objects is undeniable. Thus, there remain two options for the foundationalist about persistence-conditions to escape from the argument from the possibility of instantaneous objects: denying the possibility of instantaneous objects and denying my assumptions. I shall consider both options in turn.

As far as I can see, there are three strategies to contest the possibility of instantaneous objects that have some initial plausibility. First: On might argue that the fulfillment of the originating-conditions of any object need some amount of time and can, thus, never be fulfilled by a single slice. To assess this line of argument, some background is needed. To begin with, it is certainly true that there are physical properties of objects such that if an object has such a property at a time, this is due to the fact that the slice constituting it at the relevant time stands in specific relations to slices (whether or not they constitute the same object) at earlier or later times. For any such property, it is true what the objector says about the properties whose exemplification fulfills the originating conditions of objects: Their exemplification needs time. For our purposes, it makes sense to distinguish further between what we might call, following Hawley (see [14, p.53ff]), historical and lingering properties.13 Historical properties are properties slices have in virtue of their standing in specific relations to former slices and lingering properties are properties slices have (wholly or partly) in virtue of their standing in specific relations to later slices. This conceptual apparatus allows us to restate the objection more precisely. Apparently, there is no incompatibility between the possibility of instantaneous objects of a kind and the assumption that the fulfillment of the originating-conditions for this kind is a matter of the relevant origins having certain historical properties.14 So, the claim to which the objector is committed is that the originating conditions for all possible objects require the exemplification of lingering properties. This claim, however, is hardly defensible. Consider, again, the example of statues. I see no particularly plausible candidate for a lingering property whose instantiation by a slice might be required for this slice to be the origin of a statue. But even if I were wrong with respect to this and further examples, this would fall far short of proving the impossibility of objects whose originating conditions do not require the exemplification of lingering properties. And I know of no way to make the latter assumption even approximately plausible. So, the first strategy is rather unpromising.
Second: Another strategy appeals to vagueness. One might argue as follows: For all objects, it is vague at which point of time they begin to exist. This means that, for no object, there is a fact of the matter as to which slice is its origin. However, instantaneous objects are, by definition, constituted by their origins alone. So, for an instantaneous object, there being no fact of the matter as to which slice is its origin is the same as there being no fact of the matter as to whether it exists at all – or, alternatively, whether it is an instantaneous object. Hence, there are no clear cases of instantaneous objects. The prospects of this argument depend, for one thing, on what vagueness is. In broad outline, there are three kinds of accounts of vagueness: linguistic accounts according to which vagueness is a lack of precision of our linguistic representation of the world, epistemic accounts according to which vagueness is a lack of knowledge of the precise boundaries in the world and, finally, worldly accounts according to which vagueness is a real world phenomenon. We need not get into the details of these accounts to realize that the above argument is unsound if the linguistic or epistemic account is true. On both accounts, vagueness is not a feature of the world itself, but of our representation of the world. If one of them is true, vagueness regarding the beginning of an object does not entail that there is no fact of the matter as to which slice is this object’s origin. It would just entail that we fail to know this fact or fail to represent it precisely. Hence, the diagnosis of vagueness in the linguistic or epistemic sense does nothing to support the conclusion that there are no clear cases of instantaneous objects. Things would be different if vagueness were a real world phenomenon. In this case, vagueness regarding the beginnings of objects would indeed entail that, for the relevant objects, there would be no fact of the matter as to which slices were their origins. The commitment to the worldly account is, however, already a heavy burden for the objector. After all, there are strong arguments against the possibility of vague objects, arguments which convinced a majority of philosophers to deny it (see e.g. [8] and [31, chpt.4.9]). For this reason alone, I might not have too much to fear from the assumption of vagueness. But even if it can be shown that vagueness is a worldly phenomenon and that there are objects with indeterminate origins, this does still not entail what the objector need to show: that there can be no objects with determinate origins. And, again, I know of no way to make the assumption of this impossibility even approximately plausible.

Third: Worries regarding the possibility of instantaneous objects might also arise from the commonly held assumption that time is di-
visible at infinitum. As e.g. Hawley convincingly argues, what I call a slice should be as fine-grained as time itself (see [14, p.48]). So, if time is divisible at infinitum, the slices have no temporal extensions whatsoever. This gives rise to various tricky issues: How can slices without temporal extension add up to (the constitution of) an object with temporal extension? How could even God intervene before a second statue-slice can come into existence? I have to concede that I have no answers to these questions. But, fortunately, all problems arising from the infinite divisibility of time are at least as much the problems of the foundationalist about persistence-conditions as they are mine. After all, the foundationalist about persistence-conditions assumes that (i) objects are constituted by aggregates/successions of slices which have both intrinsic and relational properties and that (ii) an object’s persistence-conditions are a matter of the relevant slices being related to each other in specific ways. By making these assumptions she is also committed to assume that – vagueness aside – there is, for every object, one such slice which is the temporally first one constituting this object. So, it is up to her to make sense of the possibility that this slice is not related to later slices in the way required by the persistence-conditions of the relevant object. If she cannot do this, so much the worse for foundationalism about persistence-conditions. But if she can do this, the challenge posed by the argument from instantaneous objects remains in full force. So, the third attempt to save foundationalism about persistence-conditions by denying the possibility of instantaneous objects fails as well.

What is more, even if one of the above attempts to disprove the possibility of instantaneous objects succeeded, this would not automatically rescue foundationalism about persistence-conditions. Note that none of the alleged reasons against the possibility of instantaneous objects that these attempts invoke are essentially related to the reason for which this possibility is ruled out by foundationalism about persistence-conditions. So, it might still be that foundationalism about persistence-conditions fails because it rules out the possibility of instantaneous objects for the wrong reasons. And, indeed, this suspicion comes naturally to mind. Foundationalism about persistence-conditions rules out the possibility of instantaneous objects because it regards the having of persistence-conditions as a matter of their fulfillment. And this seems to be a mistake regardless of whether, for whatever reason, instantaneous objects are in fact impossible. This suspicion shall be reinforced in what follows.

What about the second option, the option of denying my initial assumptions that all objects have persistence-conditions and that their
having these persistence-conditions is part of what makes them the kind of objects they are? Since these assumptions are among the premises from which I start in this paper, I will not consider this option at length here. At any rate, while the assumptions are, of course, not sacrosanct, it should be clear that denying them would be a high price to pay. Besides that, even this would only refer to another problem: Whether or not these assumptions are true, contrary to what foundationalism about persistence-conditions implies, it does not seem to be the case that they are incompatible with the possibility of instantaneous objects.

3 The Argument from the Presence of Persistence-Conditions

According to foundationalism about persistence-conditions, an object has its persistence-conditions in virtue of these persistence-conditions being fulfilled by the slices constituting the object. As a consequence, an object A and an object B which are constituted by the same plurality of slices have the same persistence-conditions. Moreover, it is to be expected that different pluralities of slices, even if they have some elements in common, almost always fulfill different persistence-conditions. So, as a further consequence of foundationalism about persistence-conditions, if an object A and an object B are constituted by different pluralities of slices which have some elements in common, A and B almost always have different persistence-conditions. Let us say that objects A and B coincide permanently iff A\neq B and A and B are constituted by the same slices; and let us say that objects A and B coincide temporarily iff A\neq B and A and B are constituted by different pluralities of slices which have some elements in common. Since objects with different persistence-conditions cannot be identical, it follows from the above that foundationalism about persistence-conditions implies the possibility of temporary coincidence. Moreover, given the highly plausible assumption that, if objects coincided permanently, their distinctness would always be (at least in part) a matter of a difference in their persistence-conditions, it also follows from the above that foundationalism about persistence-conditions rules out the possibility of permanent coincidence. So, proponents of foundationalism about persistence-conditions are committed to both: the acceptance of temporary coincidence and the rejection of permanent coincidence.
While just this view is happily endorsed by many (see e.g. [13, 21, 24, 26, 31]), closer investigation shows that it leads to rather bizarre consequences. Consider the following pair of cases:

**Case 1:** An artist molds two lumps of clay of similar size and puts them together in such a way that the resulting lump of clay forms a statue. After some time, the statue breaks into two pieces roughly corresponding to the lumps of clay from which it was originally created.

**Case 2:** Like case 1, except that the statue does not break apart, but is destroyed by being squashed.

Case 1 is of course Gibbard’s famous case of Lumpl and Goliath (see [13]). Since, in this case, the statue (if there were one) and the lump of clay (if there were one) by which it is constituted would come in and get out of existence at the same time, it would be a case of permanent coincidence if such cases were at all possible. According to foundationalism about persistence-conditions, however, cases of permanent coincidence are not possible. So, proponents of this view have to deny in one or another way that in case 1 there are two objects, a statue and a lump of clay. In case 2, on the other hand, the statue clearly ceases to exist before the lump of clay. The lump of clay, but not the statue, survives the squashing. So, according to foundationalism about persistence-conditions, case 2 is a case of two objects, a statue and a lump of clay, coinciding temporarily.

By assumption, however, both cases do not differ at and up to the point of time at which the statue (or the lump of clay . . . ) comes into existence. That is, in both cases the slice at this point of time meets the same originating-conditions, which are, in both cases, at least the originating-conditions for statues and the originating-conditions for lumps of clay. So, since the foundationalist about persistence-conditions rejects the possibility of permanent coincidence, she has to deny for case 1 what she accepts for case 2: that the slice meeting both kinds of originating-conditions constitutes two ordinary objects. The consequence is remarkable: A person investigating the relevant slice in one of the cases is, as a matter of principle, unable to settle the question of whether there are before her two ordinary objects, a lump of clay and a statue, or just one. For the answer to this question depends on what will go on in the future. If the statue will break apart, as in case 1, and, thus, the statue and the lump of clay, will cease to exist at once, there always would have been only one ordinary object. If, however, the statue will be just squashed, as in case 2, and, thus, the statue will cease to exist before the
lump of clay, there always would have been two ordinary objects, a lump of clay and a statue. But this seems unacceptable. Is it not evident that at every point of time the number of ordinary objects existing at this point of time is determined by what goes on at and up to this point of time?

Actually, things are even worse. The person investigating the relevant slice is not just necessarily unaware of the number of objects before her, but, to a certain extent, also of their kinds. In case 2, the case of the slice’s constituting two objects, one of these objects is a lump of clay and the other a statue. In case 1, however, the case of the slice’s constituting only one object, this object is either a lump of clay or a statue. Assume for the moment that it is a lump of clay. In this case, there is, consequently, no statue in case 1. As we just saw, however, in case 2 there is a statue. So, since a person investigating the relevant slice does not know whether she is confronted with case 1 or with case 2, she is, as a matter of principle, not in the position to say whether there is a statue before her. (Equally, if the single object in case 1 were a statue, instead of a lump of clay. In this case, she would be unable to say whether there is a lump of clay before her.) But this seems even more unacceptable.

**Question 1:** Might it not be the case that in case 1 there is one object that is both a statue and a lump of clay (see e.g. [2])?

**Answer:** This could be said only if at least one of ‘statue’ and ‘lump of clay’ were not a sortal term, a term for what kind of thing an object is. For if both are sortal terms they provide different persistence-conditions which implies distinctness of the objects falling under them. Now, it might be that both terms also have non-sortal uses or that one might give them such uses. But this does not change the fact that both terms can be used as sortals; and since this is how they are used in the argument, the argument remains unaffected.

**Question 2:** The conclusion that foundationalism about persistence-conditions is incompatible with the possibility of permanent coincidence rests on the assumption that if two or more objects coincide permanently, their distinctness is, at least in part, a matter of their having different persistence-conditions. Could not the foundationalist about persistence-conditions avoid the conclusion by rejecting this assumption?

**Answer:** Hardly! For the assumption to be false, the distinctness of permanently coinciding physical objects would have to be grounded
in something not only different, but altogether independent from their persistence-conditions. The only remotely plausible candidate for this seems to be their having different modal properties. So, rejecting the assumption amounts to claiming that, if two or more physical objects coincide permanently, they differ in their modal properties without differing in their persistence-conditions. This already suffices to disqualify all familiar proposals of cases of permanent coincidence. For in none of these cases the allegedly different modal properties of the relevant physical objects are independent of their persistence-conditions. And I doubt that cases can be found for which the same is not true.

But even if the claim could be defended, it is highly questionable whether it would be of much use for the foundationalist about persistence-conditions. Since the foundationalist about persistence-conditions assumes that an object has its persistence-conditions in virtue of these persistence-conditions being fulfilled by the slices constituting the object at different times, it is to be expected that she makes a parallel assumption about what we might call transworld identity-conditions: An object has its transworld identity-conditions in virtue of these conditions being fulfilled by the slices constituting the object at different possible worlds. However, just as foundationalism about persistence-conditions entails that, for any object that has certain persistence-conditions, there have to be slices at different points of time which constitute the object by fulfilling its persistence-conditions, this latter assumption entails that, for any object that has certain transworld identity-conditions, there have to be slices at different possible worlds which constitute the object by fulfilling its transworld identity-conditions. I am not sure how many foundationalists about persistence-conditions are prepared to accept such a strong modal realism.

We see that unacceptable consequences follow from the combination of the acceptance of temporary coincidence and the rejection of permanent coincidence. And since temporary coincidence is, as Noonan puts it, ‘about as contentious as anything in philosophy could be’ [24, p.1081], we can conclude that the problem lies in the rejection of permanent coincidence. As we saw, however, this problem has its source in the assumption made by the foundationalist about persistence-conditions that an object has its persistence-conditions in virtue of these persistence-conditions being fulfilled by the slices constituting the object. On this
assumption, persistence-conditions of objects are a function of the plurals of slices constituting the relevant object. This leads to the unwelcome consequences pointed out in the above argument: that there can be no difference in persistence-conditions between objects constituted by the same slices (i.e. that there can be no permanent coincidence) and that there is no way to come to know an object’s persistence-conditions (and, thus, its kind) without investigating all slices constituting the object, that is, without waiting until the object ceases to exist.

4 Forms to the Rescue!

The argument from the possibility of instantaneous objects and the argument from the presence of persistence-conditions show that foundationalism about persistence-conditions has highly implausible or even unacceptable consequences and is, hence, to be avoided. Beyond that, however, the arguments also show what is wrong with foundationalism about persistence-conditions. As we saw, all problematic consequences follow directly from the assumption that an object has its persistence-conditions in virtue of the fulfillment of these persistence-conditions by the slices thereby coming to constitute the object. So, it is this explanation that is to be given up.

That this is no harm, becomes visible once one considers the question what it means for an object to have certain persistence-conditions in an unbiased way. At the end of section 1 I already stated what strikes me as the most natural characterization of persistence-conditions: Persistence-conditions are the conditions which have to be fulfilled for an already existing object to persist (i.e. to continue to exist). As I also pointed out, this characterization is incompatible with the idea that an object’s having certain persistence-conditions is a matter of these condition’s being fulfilled. Instead, it requires that it has to be a matter of these condition’s being in force for the relevant object; and the being in force of conditions is prior to their fulfillment. Let me call this conception of persistence-conditions – not perfectly impartial, I know – the persistence-conception of persistence-conditions. In what follows, I shall flesh it out a little bit further. To begin with, the persistence-conception of persistence-conditions requires the strict separation of an object’s persistence-conditions from its originating-conditions. The latter, but not the former, are conditions of the object’s coming into existence. To be sure, even according to this new understanding, persistence-conditions are conditions of existence in a sense: They are conditions in
virtue of whose fulfillment already existing objects continue to exist. But they are not the conditions – or part thereof – whose fulfillment brings an object into existence in the first place. Making use of the terminology of origins and originating-conditions we can say: An object’s persistence-conditions are the conditions which have to be met by a slice for this slice to constitute the object (also) constituted by the object’s origin. Saying this, in turn, amounts to the following: Persistence-conditions, while certainly abstract in nature, are not detached from the world of concrete particulars. That they are in force for particular concrete objects, means, rather, that they are features of these objects. In other words: The objects themselves are such that they pose certain conditions onto the world – to wit conditions of their own persistence. Any existing object is such that for a slice to constitute it certain conditions have to be fulfilled by this slice. As a consequence, compared to foundationalism about persistence-conditions, the order of explanation is to be changed. Not an object’s having certain persistence-conditions is explained in terms of the fulfillment of these conditions by the slices constituting the object. Rather, an object’s being constituted by specific slices that fulfill certain persistence-conditions is explained in terms of this object’s having these persistence-conditions. Figure 2 shall illustrate this idea in contrast to the idea of foundationalism about persistence-conditions (Figure 1).
In both figures the downward arrows represent the conditions of existence for a kind, K, of objects. In Figure 1 the downward arrow points to the aggregate of all slices constituting the relevant object while, in Figure 2, it points to the object’s origin alone. This illustrates that while, according to foundationalism about persistence-conditions, the coming into being of a particular object is a matter of all its slices meeting certain conditions, according to the persistence-conception of persistence-conditions, it is a matter of only one slice – the object’s origin – meeting certain conditions. Contrary to Figure 1, in Figure 2 there is also a separate arrow representing the object’s persistence-conditions. This illustrates that, in contrast to foundationalism about persistence-conditions, on the persistence-conception of persistence-conditions, persistence-conditions are not (part of) existence-conditions. Moreover, the horizontal direction of the arrow together with its originating in the object’s origin, O^K, represents the fact that persistence-conditions are in force only with respect to a specific origin of an object, that is, with respect to an already existing object.

That the persistence-conception of persistence-conditions is indeed preferable to foundationalism about persistence-conditions is shown by the fact that it outstrips the latter with respect to its capability to solve all the problems considered in this paper. For one thing, since it also does not entail the mistake of regarding persistence-conditions as conditions of the obtaining of identity, it faces none of the problems of the identity-conception of persistence-conditions. So, in this regard it is on a par with foundationalism about persistence-conditions. Beyond that, however, it also succeeds where foundationalism about persistence-conditions fails: It affords the correct descriptions of the cases considered in the above arguments. According to the persistence-conception of persistence-conditions, the fact that the artifact in case 2 of the argument from the possibility of instantaneous objects is destroyed immediately after its coming into existence does not prevent this artefact from having the persistence-conditions of statues and, thus, from being a statue. For, if having certain persistence-conditions is not a matter of these persistence-conditions being fulfilled, there is no problem with the assumption that even an instantaneous object has certain persistence-conditions. By the same token, the persistence-conception of persistence-conditions does not entail the impossibility of permanent coincidence which gave rise to the unacceptable conclusion revealed by the argument from the presence of persistence-conditions. If an object’s persistence-conditions are not a function of the slices constituting it, nothing rules
it out that two or more objects have distinct persistence-conditions even though they are constituted by the same slices.

However, the persistence-conception of persistence-conditions just tells us what it means for an object to have certain persistence-conditions. What we do not have as yet, is an alternative answer to the question what makes it the case that an object has the persistence-conditions it has. Let me conclude the paper by offering a cautious suggestion on how such an answer might look like. To begin with, since, according to the persistence-conception of persistence-conditions, an object has its persistence-conditions from the first moment of its existence, its having these persistence-conditions can hardly be grounded in its physical constituents. How could the slice that is an object’s origin bring it about that, for this object, certain persistence-conditions are in force? The suspicion that this is impossible is reinforced by the fact that it seems perfectly possible that two kinds of objects differ in their persistence-conditions while they have the same originating-conditions. In such a case, the object’s persistence-conditions could not be grounded in their origins, for, since the origin of an object of one of these kinds would, necessarily, also be the origin of an object of the other kind, there would not be a difference in the relevant object’s origins that might explain the difference in their persistence-conditions.

What might be an alternative answer? Recall that, in my explanation of what it means for an object to have certain persistence-conditions, I made use of the phrase ‘objects pose conditions of their own persistence onto the world.’ My proposal relies on taking this phrase literally. That is, I claim that physical objects really pose conditions of their own persistence onto the world. How do they do this? Well, the capability of posing conditions onto the world is usually taken to be a privilege of abstract entities, like concepts or propositions. Given this, the following proposal suggests itself: objects have this capability in virtue of containing such an abstract entity as a proper part. Objects are, in other words, partly intensional (or even hyperintensional) entities (see [7, p.305/6] or [10, p.69] for similar remarks).

This idea is familiar from an Aristotelian view (or family of views) which currently undergoes a kind of revival: so-called hylomorphism. According to hylomorphism, composite objects have two aspects: matter and form. For physical objects, to which we shall restrict our considerations, the matter is something like the aggregate of all slices constituting the object throughout the time of its existence and the form is a kind of principle – sometimes called ‘principle of unity’ (see [16]) – which states
the conditions a slice has to meet in order to be part of the matter of the object. Many contemporary hylomorphists assume, moreover, that an object’s form is itself a proper part of the object, alongside the object’s matter (see e.g. [10] or [18]; for criticism, see [9] or [16]). With this assumption in place, my proposal can be understood as a version of hylomorphism. According to such an understanding, the abstract component posing the object’s persistence-conditions onto the world is the object’s form, whereas the object’s origin together with the slices meeting these conditions are its matter.

But while my proposal can be regarded as a form of hylomorphism, it differs significantly from standard versions of hylomorphism. Proponents of these versions fail to take into account the crucial distinction between originating- and persistence-conditions. They think of the form of an object as a single bunch of conditions which are to be met (individually and collectively) by all slices constituting the object throughout its existence. To oversimplify somewhat, they regard the form as ‘picking out’ the whole matter of the object at once (see [10], [16], [18, chpt.7]). Such an understanding leaves no room for the distinction between originating- and persistence-conditions, for the distinction between conditions which are to be met for the object to come into existence and conditions which are to be met for an already existing object to continue to exist. According to such an understanding, all conditions posed by the form are of the former kind. As a consequence, an object’s having certain persistence-conditions cannot but be understood as a matter of these conditions being fulfilled. Thus, standard hylomorphism misses the real character of persistence-conditions in the very same way it is missed by foundationalism about persistence-conditions: by failing to do justice to the fact that an object’s persistence-conditions are set into force only by the object’s coming into existence. According to my proposal, in contrast, an object does not have its form in virtue of the fact that this form is fulfilled by the slices constituting this object. That an object has a specific form (i.e. a specific abstract component) is, rather, a primitive fact. Accordingly, an object’s form does not have to wait for being fulfilled in order to enter into an object. It can be part of the object as soon as it comes into existence.

This, to be sure, is hardly more than a sketch of a positive proposal. Much work will have to be done to make it into a mature philosophical account; work that has to wait for another occasion.
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**Notes**

1 By the phrase ‘...in virtue of...’ I mean to express the relation commonly known as *grounding*. Grounding is said to be a genuinely metaphysical, non-causal dependence-relation which obtains between a fact and one or more other facts if the former obtains in virtue of the latter (for details see [4]). Whether there really is such a thing as the grounding-relation is a matter of some dispute (see e.g. [5], [23], [36]). I, for my part, assume that this is so (at least for the present paper). Accordingly, most of my uses of phrases like ‘p in virtue of q’, ‘p is prior to q’, ‘p because of q’ and so on are meant as expressing this or closely related relation. (Thanks to an anonymous referee for making me aware of the need to be explicit in this regard!) I am pretty sure, however, that my crucial points would stand even if there were no such thing as grounding. In this case, the relevant points would have to be restated in terms of relations like explanation, supervenience, reduction and so on, that is, in terms of members of the family of relations which the idea of grounding aims to unify.

2 Note that ‘kind’ is used here in a restricted sense. A kind in this sense is only what is expressed by a so-called substance-sortal, a predicate that answers the question what an object most fundamentally is (see [22], [32], [37]). Which predicates fall into this class and, thus, which kinds of objects there are, is, of course, a contentious issue.

3 Let me stress, however, that there is nothing wrong with this way of talking as long as one is aware of the danger of being misled into the relevant misconception (see also [21, p.192ff]).

4 Pace Geach (see [11], [12]).

5 With that said, how can it be that when Swinburne and other proponents of the identity-conception of persistence-conditions consider questions of the diachronic identity-conditions of various kinds of objects, they give (i) different answers for different kinds of objects and (ii) answers that are both informative and substantial (see, next to [34], e.g. [30], [33])? The only plausible answer seems to be that they misapprehend what they are doing. They take themselves to be looking for conditions of the obtaining of identity, but really do something else.

6 From now on, I will return to the more adequate terminology of persistence-conditions.

7 Parallel to ‘the identity-conception of persistence-conditions’ and ‘the persistence-conception of persistence-conditions’ (see section 4), this conception might well be called ‘the existence-conception of persistence-conditions’. Its relation to foundationalism about persistence-conditions is best described as the relation between a concept or conception of something and a theory that works out this concept or conception. Since I will deal with the theory directly, I will not have much use for the suggested denomination.
This latter term is, moreover, intended as neutral regarding the question whether an object is something over and above the slices constituting it at the various times of its existence. To anticipate: The view I will suggest at the end of the paper is one of the views according to which this is not the case. It contains the assumption that objects have abstract forms as additional components next to the slices constituting them. With this in view, it is advisable to have, from the very beginning, a terminology that allows for this possibility. For the characterization of Lewis’ position, to be sure, this possibility has no relevance. According to Lewis and other foundationalists about persistence-conditions, an object at a time is nothing over and above the slice constituting it at that time.

It is not always easy to say who is a foundationalist about persistence-conditions. The reason is that the question on which this depends is something of a blind spot in the debate. Most authors are confident with (i) opting for three- or four-dimensionalism or (ii) saying something about what the persistence-conditions of certain interesting objects (e.g. persons) are. But the question in virtue of what objects have their persistence-conditions is rarely tackled explicitly. However, next to Lewis, Armstrong (see [1]), Heller (see [15]), Quine (see [28]) or Sattig (see [29]) are rather clear examples of foundationalists about persistence-conditions.

In fact, I know of no foundationalist about persistence-conditions who explicitly draws this conclusion. I think, this just shows that there is little awareness of the problems I raise in this paper.

Why draw on God here? Because slices are so ‘small’ that only god may be quick enough to destroy an object before its persistence-conditions are fulfilled by a second slice. Hereby, I rely on the assumption that the existence of God or a being with comparable skills is at least possible.

An anonymous referee raises the following, rather cunning, objection against my statue-case: For being build the statue has to be perceived. But being perceived is precisely one of the properties whose instantiation needs some time, i.e. which cannot be had by an isolated slice. First of all, this objection, at best, undermines my example case, but not the whole argument. The argument rests on the assumption of the possibility of instantaneous objects, not on the illustrative case of the statue. Beyond that, I am not sure whether the objection even undermines this case. It is certainly right that, in order to build a statue, an artist has to perceive the matter from which the statue is built throughout the process of the building of the statue. But why assume that she has to perceive the completed statue (due to its immediate destruction) would not change the fact that, at the relevant moment, there was a statue.

Note, however, that Hawley’s use of these terms is not precisely the same as mine.

Indeed, just this seems to be the case for many objects. Consider statues, the example I utilize for my argument: It seems pretty plausible that for a slice to be the origin of a statue it has to instantiate, next to certain intrinsic properties (sufficient solidity, a size in a certain range...) certain complex and, presumably, highly disjunctive historical properties (being brought about by an artist with certain intentions and so on).

See [17] for a thorough introduction.

The qualification ‘ordinary’ is meant to circumvent the following problem: It is all but uncontroversial that the relevant slice constitutes at most two objects. If e.g. Lewsiean universalism were true, it would – like any other slice – constitute
innumerable distinct objects: one for any set of (past, future and possible) slices to which it belongs. What is worse, it is not even clear that in this case it would follow from foundationalism that the number of objects constituted by the relevant slice differs in both cases. But this is necessary for the argument to go through. If the domain of objects under consideration is restricted to ordinary objects like lumps of clay and statues (whatever this might mean exactly), no such problem arises. However things might be with respect to objects in general, foundationalism about persistence-condition does imply that the number of ordinary objects constituted by the relevant slice differs in both cases – or so I argue.

17 This argument can as well be presented as a transcendental argument. Take as starting point the assumption that it is possible for us, at least in principle, to come to know via empirical investigation how many objects there are at a point of time and of what kinds they are. Since we can have no empirical knowledge of the future, it is a condition of this possibility that these facts do not depend on the future. Foundationalism about persistence-conditions, however, implies that they do depend on the future. Hence, foundationalism about persistence-conditions is false.

18 Here, I will not consider the specific character of the relevant condition. Presumably, however, it is best regarded as the condition to stand in a certain relation to the origin of the relevant object; whereas this relation is to be understood as entailing something like the presence of a continuous succession of slices from the origin to the slice in question.
References


