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Persistence, Time, and Temporal Parts

Introduction:

In ordinary life, I don't think that anyone takes seriously the possibility that all the objects they regularly encounter; tables, chairs, and their very own person, might be different things than the objects that existed in the previous moment. The persistence of objects over time seems to be a Moorean fact. We seem to know with more certainty that objects persist over time better than the premises of any philosophical argument for the contrary. The concept of persistence is deeply embedded into our ordinary worldview. There are two parallel cases to consider here, one about the persistence of objects and one about the persistence of persons. The persistence of objects concerns how things like tables, chairs, or even fundamental particles can exist across time. In ordinary life, people hold two main intuitions about relating to object's persistence over time: (1) objects can survive small changes in their parts and; (2) objects can survive small changes in their properties. An example of (1) would be if you were to replace the front door knob to your house without destroying your house. An example of (2) would be if you were to paint your house a new shade of blue without destroying it. In both cases, it seems that small changes are not enough to destroy your house and bring a new one into the world. To think that objects do not persist over time would be a radical departure from how we typically view the world. If only it were so then a simple change of paint could void a mortgage, but no one seriously takes that to be the case. Likewise, I consider that the computer that I write this sentence on is the same computer that I wrote the previous sentence on, even

though I wrote each sentence at different moments in time. Whether they really do persist over time, or not, we act as though objects do.

A similar story emerges if we talk about persons.[1] In ordinary life we hold that the self persists over time. The ordinary intuitions we hold true about objects also hold true about persons, with some revision necessary for those theories of persons that have no physical parts.[2] The idea that we are the same person who persists over time is deeply tied to our attitudes. If persons did not persist over time then feelings like hope, fear, regret, and responsibility would make little sense. These attitudes only make complete sense when they refer to the same person. I can be held responsible for the actions of my past self, but I cannot be held responsible for the actions of another person. I recoil at the prospect of my future self being tortured in a way that I do not when some other person is substituted in my place. We hold special attitudes towards ourselves, but these attitudes make little sense if we are not the same person over time.

It seems commonsensical that objects - both material objects and persons - persist over time, but *how* objects persist over time remains an ongoing debate among philosophers. Debates about persistence are inexorably linked to debates about the nature of time, and are often tied up in various puzzles and paradoxes about identity. This paper will defend a temporal parts theory of persistence, according to which objects persist because they have different parts at different times, coupled with eternalism, the theory of time that states that all times and their contents are equally real. My argument will precede by first establishing the correct theory of

[1] I do not advance a particular theory of personhood in this paper. I will refer to various theories of personhood to show how persons are susceptible to the same problems as material objects.
[2]If persons are made up of otherworldly substances then those persons are made up otherworldly parts. If persons are made up of their psychologies then those psychologies might have different parts (like Pixar's Inside Out)

time, and then argue against the leading alternative to temporal parts theories of persistence by showing how temporal parts are useful in solving puzzling cases of persistence.

In the first part of the paper I will provide a sketch of the main theories of persistence. I will give an overview of the temporal parts theory and its leading alternative, the endurance theory. The second part of the paper will address the two main competing theories of time, eternalism and presentism. The paper will then turn towards some troubling cases involving persistence to illustrate the advantages of the temporal parts theory. The third part will deal with coincident objects. The fourth will deal with Sorties cases.

Theories of Persistence:

There are two main theories that describe how persistence occurs. Perdurance theory, sometimes referred to as perdurantism or four-dimensionalism, posits a metaphysics of temporal parts to explain persistence. In contrast, endurance theory, sometimes referred to as endurantism or three-dimensionalism, rejects a metaphysics of temporal parts and explains persistence without them. I will provide a brief overview of both views in turn.

Perdurance

Perdurantists believe that objects persist by having different parts at different times. David Lewis provides a good definition of the position, “Something perdures iff it persists by having different temporal parts, or stages, at different times, though no one part of it is wholly present at more than one time;”[3] Here is a modified version of the definition Theodore Sider provides for a temporal part:

[3] Lewis, David K. *On the Plurality of Worlds*. Malden (Mass.): Blackwell, 2013. Print.

> X is a *temporal part* of y at instant $t =_{df}$ (1) *x* exists at *t*; (2) *x* is a part of *y* at *t*; and (3) *x* overlaps at *t* everything that is a part of *y* at *t.*[4]

This definition, in particular (3), captures the idea that an object's temporal part are the same size spatially as the whole object. Temporal parts are analogous to spatial parts.[5] Just as something may be extended across space by having different parts in different places, so too might something be extended across time by having different parts at different times. Here is how a perdurantist would describe an object like the Statue of Liberty. Some of the Statue of Liberty's temporal parts are in the 19th century when it was first built. The Statue of Liberty also has some of its temporal parts in 20th century and more temporal parts in the present. Talking about the Statue of Liberty's temporal parts is analogous to talking about its spatial parts. We might say something like the Statue of Liberty is in two different places as the same time. Part of the Statue of Liberty is next to the ground (its feet) and part of the Statue of Liberty is hundreds of feet above the ground (its torch). The feet and the torch are stretched out over space to constitute the whole Statue of Liberty. Perdurantist's say that the Statue of Liberty's temporal parts are stretched out over time similar to how its spatial parts are stretched over space.

When we refer to an object we refer to the totality of its parts. If we say something like "The Statue of Liberty is three hundred and five feet tall" we mean to include the entire spatial extent of the statue in our measurement. It makes little sense to ignore one of those parts, like the torch, when discussing the "Statue of Liberty." The analog when we incorporate temporal parts into our metaphysics means that when we refer to something like the Statue of Liberty we are referring to all of its parts, including its temporal parts. This means we are referring to

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[4] Sider, Theodore. *Four-dimensionalism: An Ontology of Persistence and Time*. Oxford: Clarendon, 2010. Print. p.59

[5] Taylor, Richard. "Spatial and Temporal Analogies and the Concept of Identity." *Persistence: Contemporary Readings*. Ed. Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print.

something that is extended across time from the 19th century to the present and even into the future. Perdurantists call this thing extended across time a “worm” because it is stretched out over time like how earthworms are stretched out over space. At any given moment we might want to focus on a particular part of the four-dimensional Statue of Liberty worm. Just like earthworms have segments, so too do four-dimensional worms. These are called time slices and there exists a time slice for every moment a worm exists. The whole worm is simply the fusion of all the slices. Often times we only care about a few time-slices of an object, like the time slice of the Statue of Liberty that exists on the day you visit New York City.

A certain subset of temporal parts theorists adhere to what they call the stage view or a theory of exdurance.[6] Stage theorists agree with perdurantists about the ontology of temporal parts. According to them, objects have temporal parts the same way as perdurance theorists think they do. Stage theorists differ from perdurantists in what they think material objects actually are. Whereas a perdurantist thinks the Statue of Liberty is part of a larger, four-dimensional “worm,” a stage theorist thinks that the Statue of Liberty is the particular temporal part that exists at a given time. The Statue of Liberty is the time-slice that exists at a given moment. In other words, according to perdurantists the Statue of Liberty is the “Statue of Liberty-Worm” and according to stage theorists the Statue of Liberty is the current time slice of the “Statue of Liberty-Worm.” Both perdurance and stage theories function in much the same way. Their adherence to a theory of temporal parts allows them to solve various puzzles and paradoxes of identity similarly, the substantial differences between the two come out in the particular way that they attempt to resolve some troubling cases. For the sake of convenience, I will refer only to perdurance theories when I refer to a doctrine of temporal parts, as it is a more

[6] Sider, Theodore (1996). All the world's a stage. Australasian Journal of Philosophy_ 74 (3):433 – 453.

popular position in the literature. I will make note when the stage theory offers different solutions to problems.

Endurance

In contrast with the above theories, endurantism does not adhere to a doctrine of temporal parts. An object "endures iff it persists by being wholly present at more than one time." [7] Enduring objects are wholly present at different times. Whenever an enduring object exists it is wholly there. There is some obscurity as to what it means for an object to be "wholly present" at a given time. An ordinary view about an object being fully present at different times is that all of that object exists at both times. In other words, two different times share the enduring object. If the Statue of Liberty is an enduring object, then the Statue of Liberty that existed during the 19th century is numerically identical to the Statue of Liberty that exists in the 21st. The Statue of Liberty was "wholly present" at each moment from the 19th century to the 21st century.[8]

The phrase "wholly present" has drawn some criticism. Sider presents the argument that what "wholly present" means cannot be coherently stated.[9] The problem with the term as Sider poses is a dilemma between a formulation of "wholly present" that is trivially true and a formulation that is stringent enough to deny the possibility that something can gain or lose any of its parts. As a result, Sider thinks the concept of "wholly present" does not make any coherent sense, which if true would certainly be troubling for presentism. An initial starting place might as Sider thinks, "take '*x* is wholly present at *t*' to mean that everything that is a part of *x at t* exists at

[7] Lewis, On the Plurality of Worlds, p.51
[8] Perdurantist's would also say that you are referring to the same worm both times even though what you are referring to is not wholly present.
[9] Sider, Four-dimensionalism, p.64

t."[10] This formulation is no good in that it is trivially true as it merely states that a part of an object at a given time exists at that time. On the other side of the spectrum Sider presents a stronger view of "wholly present":

> *X* is *strongly wholly present* throughout interval T = $_{df}$ everything that is at *any* time in T part of *x* exists and is part of *x* at *every* time in T.[11]

This formulation of "wholly present" is too strong for many endurantists. It entails that objects cannot survive the gain or loss of their parts, in which case, persistence as we commonly think of it is impossible. According to this definition, getting a haircut would exclude someone from persisting. There are some who are satisfied with this formulation, namely mereological essentialists (more on them later), but for most endurantists this definition is too strong. Various endurantist's have responded to Sider's challenge and have provided various explications about what "wholly present" mean for instance Crisp and Smith define "wholly present" as:

> (**WP**$_{2.@t}$) *x* is wholly present at t =df.
>
> (i) *x* exists at *t*;
>
> (ii) no part of *x* at *t* (of which *x* isn't a part at *t*) shares a part at *t* with everything that is a part of x at *t*; and
>
> (iii) for any *y*s, if the *y*s properly compose *x* at *t* then the *y*s wholly compose *x* at t [12]

This definition avoids the woes of both of Sider's formulations. This definition captures the motivating intuition behind endurantism. If an object exists at a time then all of its parts are at that time.

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[10]Sider, Four-dimensionalism, p.64
[11] Sider, Four-dimensionalism, p.64
[12]Crisp, Thomas M., and Donald P. Smith. "'Wholly Present' Defined." *Philosophy and Phenomenological Research*, vol. 71, no. 2, 2005, pp. 318–344., www.jstor.org/stable/40040860.

Another, simpler option is available for the endurantist. They could take “wholly present” as primitive and the theory would still be intelligible. All other things being equal, a theory with fewer primitives is preferable to a theory with more. As such, adopting “wholly present” as a primitive might be undesirable for reasons of parsimony. A second worry arises if Sider’s objection that “wholly present” is unintelligible holds. If “wholly present” is unintelligible, making it a primitive does not make it any more intelligible. The advantage of taking “wholly present” as a primitive is that it does not need a formal definition. There is no consensus as to how much taking on extra primitives disadvantages a theory. There are compelling reasons why endurantism should be rejected that are more substantial in their content than counting the number of primitives, so this worry can be largely ignored.

Theories of Time:

There are two main theories about the nature of time. The theories differ mainly over whether or not they think the present is somehow special. According to eternalism past and future times and their contents are just as real as the present and its contents. In contrast, according to presentism only the content of the present time and its content exist.

Eternalism

Eternalists think that time is another dimension just like the three spatial dimensions. Objects exist at particular spatial temporal locations. To refer to where objects are in the universe, an eternalist would give both a place and a time. For instance, an eternalist might refer to “Times Square in New York in August of 2016”.[13] Eternalists think that no time is

[13] Loux, Michael J. *Metaphysics: A Contemporary Introduction*. 3rd ed. London: Routledge, 1998. Print. p.233

ontologically privileged, which means that all times and their contents are equally real. For instance, an eternalist thinks dinosaurs exist as real entities. The fact that people in the present lack access to dinosaurs does not make them any less real than objects in the present. It is absurd to say that the red spot on Jupiter is not real because it is, spatially, far away. Likewise for an eternalist it is absurd to say that dinosaurs are not real since they are far away temporally. The same could be said of future objects. Martian outposts, if they are built in the future, are just as real as any other past or present object. When an eternalist says something like “Dinosaurs exist right now” they could mean one of two things. They could be talking in the ontological sense, meaning that there are entities that are dinosaurs which exist. For an eternalist this is a true statement. They could also be talking in a spatial-temporal sense, meaning that there are entities that are dinosaurs which exist in the current time. For an eternalist this is a false statement.

Presentism

In contrast to eternalists, presentists think that only the present time and what exists at the present time is real. According to presentism, the present is ontologically special, in that, the only things that exist are present things.[14] According to presentism, dinosaurs and Martian outposts do not exist. They may have existed or they might exist, but as a matter of fact they do not exist. This picture seems to match up with our pre-theoretic intuitions. If someone were to claim that dinosaurs or martian outposts exist we would think they were mistaken. There are various theories of time related to presentism, such as the “growing block” view that thinks the past and the present are real while the future is not. These views share the idea that the present is somehow special. The fact that people can access the present, but not the past or future,

[14] Markosian, Ned. "A Defense of Presentism." *Persistence: Contemporary Readings*. By Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print. p.307

makes the present unique. No one can go and see real dinosaurs romping about during the Jurassic or visit the Martian outposts of tomorrow, but people can go see all sorts of objects that exist in the present.

Persistence and Time

All of the pairings between accounts of persistence and time are conceivable although some have advanced the idea that the two positions are linked.[15] The pairings of eternalism-perdurantism and presentism-endurantism are the most prominent in the literature about persistence, but there are many who defend a eternalism-endurantism viewpoint.[16] Presentist-perdurantism seems theoretically possible, albeit a weird view, and it is not a popular position. The presentist-perdurantist position sounds strange since it claims both that only present times and their contents exist and that objects persist by having parts at different times (some of which are not in the present). This might be a place where the stage view makes more sense than perdurantism. An object that is its temporal parts at the present time seems to make more sense than a worm stretched out over various times, if most of those times do not exist. This paper will defend the eternalism-perdurantism position. This means rejecting both presentism and endurantism, which I will argue for in turn.

Problems with Presentism

[15]Carter, William R., and H. Scott Hestevold. “On Passage and Persistence.” *American Philosophical Quarterly*, vol. 31, no. 4, 1994, pp. 269–283., www.jstor.org/stable/20009790.

[16] Loux, p.234

There are two major problems with presentism that make the position untenable. Firstly, the “truthmaker” objection, which argues that presentism struggles to refer to past and future objects. Secondly, presentism seems to be at odds with our ordinary world view. I will spell out both of these objections in turn.

The first objection to presentism relies on the concept of truthmakers. According to this view, for any given a proposition, there must be something in the world that makes the proposition true.[17] Truthmakers are the ontological grounding that makes propositions true, without them, there is nothing in the world in virtue of which a proposition is true. If I were to say “the sun is yellow”, I could then point to something in the world, the sun, that makes the sentence true. When talking about truthmakers there is debate about what the truthmaker actually is, objects or facts. In the case of “The sun is yellow” one might point to the sun, the object, to make the statement true or one might point to the fact that the sun is yellow to make the proposition true. The truthmaker objection to presentism can be presented in either case. If truthmakers are objects, then the presentist can only point to present objects to make propositions true as non-present objects do not exist. If truthmakers are facts then presentists can only point to present facts to make propositions true. It is strange to try to talk about facts of non-existent things in the first place. What color are unicorns?. How many teeth does a dragon have? To say there are true facts about non-existent things, besides what is true of them by definition, presupposes what those things are like. It is correct to say that a unicorn is a one-horned animal since that is built into definition of a unicorn, but it makes no sense to say that unicorns are purple as they do not exist. This presents limits for the presentist, restricting what they can use as truthmakers to what exists, in this case, only present things.

[17] Zimmerman, Dean. "The privileged present: defending an ‘A-theory of time." *Contemporary debates in metaphysics* 10 (2008): 211.

The truthmaker objection to presentism is that since presentists think that past and future objects do not exist, then there is nothing that exists to make propositions involving reference to non-present times true. If the objection holds, presentists will need to give an account for how we refer to the contents of past and future times. This is problematic for the presentist when faced with sentences like “Dinosaurs walked on Earth” as this sentence makes reference to something not in the present time. The objection is presented as follows:

1. Presentism violates the truthmaker principle.[18]
2. If Presentism violates the truthmaker principle, then it is false.
3. Therefore, presentism is false.

A similar argument could be formed with a proposition based on the future. Instead of a proposition about dinosaurs something like, “There will be Martian outposts” could be substituted to make the objection work for the content of future times. This objection is troubling for the presentist as it does not seem like they have a way to make sense of propositions dealing with non-present time.

The externalist account of time does not have similar problems. To make sense of the proposition “dinosaurs walked on Earth”, to provide it with a truthmaker, an eternalist can point to a dinosaur living in the past. According to eternalists, the dinosaur is a real entity that makes the proposition true. Likewise for fact-based truthmakers, the eternalist could point to the fact that dinosaurs walked on Earth to make the proposition true. Again by looking to dinosaurs as real entities. A presentist cannot resolve the truthmaker objection in the same way as they cannot appeal to the existence of dinosaurs as they believe that anything in the past, like the dinosaur, does not exist.

[18]The truthmaker principle can be presented with either objects or facts as truthmakers.

To get around this problem, some presentists claim that there are backward-looking and forward-looking properties that make things true.[19] In the case of the dinosaur, it is in virtue of the Earth having a property of *having been walked on by a dinosaur* that makes the proposition true. The parallel solution for fact-based truth makers is that, it is now true that a dinosaur walked on Earth. The subject of the proposition is not the dinosaur, but rather the Earth which exists. Similar explanations can be offered to deal with future events. Mars has the property that *it will have Martian outposts*. This way of dealing with describing the contents of non-present times seems to do the job well enough to satisfy the truthmaker objection, but not without cost.

The response forces some amount of paraphrasing of ordinary speech. In ordinary life, if someone utters the proposition that “dinosaurs walked over the Earth” they mean to quantify over dinosaurs as a real entity. The presentist cannot preserve this manner of speaking as there are no dinosaurs to quantify over. The best case the presentist can provide here is perserving the form of propositions accompanied with an unusual analysis of their underlying structure involving tensed-properties.[20] The worst case for the presentist is that whenever we might utter a proposition that refers to the content of a non-present time is susceptible to some manner of paraphrasing. When people talk of past and future objects, they talk of them as real entities, but the presentist disallows that people might talk of the non-present world in this manner. This solution makes it the case that when people talk about the past and future objects they are really talking about things in the present with forward or backward-looking properties. When people say that “dinosaurs walked on Earth” it seems like people are trying to talk about dinosaurs, not that the Earth has the property *used to contain dinosaurs*. Dinosaurs, not the

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[19] Zimmerman p. 217

[20] Haslanger, Sally. "Persistence, Change, and Explanation." Persistence: Contemporary Readings. By Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print. p.165

Earth, seems to be the subject we have in mind, so strongly that it seems like a Moorean fact. People know the subject of their sentences, but they do not know anything about forward or backward-looking properties. Presentism switches the two around.

The strength of this objection rests on how we understand and use language. If the presentist's response falls within the realm of normal language usage then their response to the truthmaker objection poses little trouble. However, the eternalist account is preferable because it is more flexible, simpler, and better captures how people use language.

The kind of tensed properties the presentist uses to point to truthmakers are not in dispute. Even an eternalist would say the Earth has the property of *used to contain dinosaurs*. If that property is a sufficient truthmaker for the presentist, it will also be a sufficient truthmaker for the eternalist. This is the best case for the presentist; they get to provide a sufficient truthmaker that resolves the objection. However, even in this case the eternalist can provide a stronger account of the truthmaker. The eternalist can use the same truthmaker as the presentist and the eternalist can also point to the dinosaur as a distinct entity to serve as a truthmaker, but the presentist cannot do the same. That means whenever a presentist can provide a truthmaker, the eternalist can too, but the reverse is not necessarily true. As a result, the eternalist can provide a stronger case than the presentist when pointing to truthmakers making them better able to deal with potential skeptics who doubt a proposed truthmaker.

A second advantage to the eternalist explanation is that it better accounts for how people use language. An appeal to backward-looking or forward-looking properties is more complicated than an appeal to an object itself. "Dinosaurs" is simpler than *used to contain dinosaurs*. The usage of either might be justified, but if given the choice the simpler one ought to be prefered.

The response also comes at a real risk of ontological bloat. Eternalists do not need to have backward-looking and forward-looking properties in their ontologies, but the presentist does. A similar charge might be levied by presentists against eternalists as they do not need to have past and future things, but the eternalist does. In fact the eternalist might be worse off as it has to account for past and future things and backward-looking and forward-looking properties. The existence of non-present time does not make backward-looking or forward-looking properties any less real. The Earth at the present still has the property of being such that it *used to contain dinosaurs* and as such there seems no reason for an eternalist to deny its existence, although they might deny its usefulness. The reply for both camps are rather similar. Once objects are accepted into an ontology, it makes little difference to accept more objects into that ontology especially if they really exist as the eternalist thinks they do. There is no bloat insofar as the new things being added into the ontology are not a new kind of thing. The same thing might be said of backward-looking and future-looking properties. At the point in which properties are accepted into the ontology, there is little worry to adding more properties. The main difference between the two camps here is that presentism relies on thies more unnatural properties to explain their propositions. Eternalists admit their existence, but largely ignore them in their understanding of the world.

More problematic for the presentist is the problem that it runs against most everyone's ordinary view of the world. Lewis frames this objection as follows, "No man, unless it be at the moment of his execution, believes that he has no future; still less does anyone believe that he has no past."[21] The implication in Lewis's claim is that the presentist denies the possibility of persistence, the only properties a thing has are what they have at the present moment. Since past and future entities do not exist, they cannot have properties in any kind of way that can be

[21] Lewis, On the Plurality of Worlds, p.204

referenced by real things. Of course, this outcome is a wild deviation from how people ordinarily view the world. We have various attitudes towards the future: people have hopes, dreams, fears, real genuine feelings towards their future selves, which if presentism is true, are attitudes towards something non-existent. Looking to the past the picture is even more worrisome. People have regrets about past actions, people take responsibility for what their past selves did, but if things do not really exist then these attitudes make little sense. This alone seems to be reason enough to give up presentism.

A presentist might respond by trying to undercut the above argument by invoking backward-looking and forward-looking properties.[22] In order to make sense of our attitudes towards the future, the presentist might say that a person has a forward-looking property that characterizes them at the present. A person has the property of currently hoping. Likewise when dealing with the past, a person has the property of currently regretting. A consequence of this reply is giving up the idea that these kinds of attitudes are relational. This reply seems limited, in that, the kind of hoping and regretting posited by the presentist seems to be different than the kind presented by the initial objection. Hoping, in the sense it was originally presented, is a two place relation between a person's present and future selves. $\text{Person}_{\text{present}}$ hopes that $\text{Person}_{\text{future}}$ does *x*. In contrast, the presentist solution is a one place property. $\text{Person}_{\text{present}}$ hopes looking forwardly. When people hope in ordinary life, it seems like they make reference to some other thing, making hope a two-place relation. The kind of hoping the presentist describes does not seem to be the kind of hoping that people do.

The problem exists for even what we consider the present moment. It takes time for information from the external world to reach our sense organs, and afterwards it takes time for

[22] Hinchliff, Mark. "The Puzzle of Change." *Persistence: Contemporary Readings*. By Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print. p.290

our minds to process that information. In other words, there is a time gap between external stimuli and the mind's ability to process that information. Perception comes after external experiences in the world. This leaves the presentist with a worry: if all perception comes after the stimuli, then that means we cannot ever be currently experiencing the world, since all the sensory information we received is from objects which no longer exist. There are two parallel arguments here. One leads us to think that the information that we sense from the world is information about a non-existent world. The second leads us to think that the information that we perceive is of a non-existent world. The difference between the two is based on the difference between sensation and perception. The first refers to just receiving external stimuli while the second deals with the brain processing it.[23] The argument that presentism leads us to have sense a non-existent world is as follows:

1. Information takes time to go from the world to our sense organs
2. From (1), Our sense organs pick up information about the world in the past
3. According to presentism, the world in the past does not exist
4. From (1), (2), and (3) Our sense organs pick up information about a world that does not exist

The justification for (1) and (2) are based on the empirical fact that it takes time for information to go from the world into our sense organs. For instance it takes time for light to reflect off a mirror to show a reflection. (3) is a premise of presentism, that non-present times do not exist and so the world in the past does not exist. This leads to the conclusion (4) that our sense organs pick up information. The argument dealing with perception can be constructed by

[23] The distinction matters in cases where sensation and perception do not line up, like with optical illusions.

changing (1) and (2) to refer to perceptual apparati (the brain) instead of sense organs.[24] At face value, the conclusions in (4) seems rather weird. It is not obvious what it means to sense or perceive something about a world that doesn't exist. The closest analog might be the faculty of imagination, but even imagining can be construed as a reassembling of various features of the present world. Even if successful, this move would have the presentist give up objectivity.

Additionally, one interpretation of (4) suggest a commitment to a skepticism about the external world. The world that we sense and perceive does not exist and as such we must be skeptical about it. This seems like a real weakness to presentism, as it now entails a certain epistemic view that eternalists are not beholden to. Surely the presentist does not want such skepticism built into its theory.

A more relaxed interpretation of (4) might be that we don't experience the world as it is, but rather as it was. This interpretation is hard to make sense of under a presentist theory of time. It sounds very strange to say that the world we experience is one that does not exist. Being strange is not reason enough to say that presentism is false, but it does provide a good motivation to find a less strange theory.

I find the above worries sufficient to motivate rejecting presentism. This leaves eternalism as the best remaining the theory of time. I will now turn to discussing the two theories of persistence. I will first provide arguments against endurance views, which I think are compelling enough to abandon the position, but for those left unsatisfied I will then go on to address three puzzling cases that have proved challenging for theories of persistence. These cases provide greater reason to adhere to a perdurance theory.

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[24] The parallel argument dealing with perception is spelled out below:

1.1. Information takes time to go from the world to our perceptual apparati
2.1. From (1.1), Our perceptual apparati process information about the world in the past
3. The world in the past does not exist
4.1. From (1.1), (2.1), and (3) Our perceptual apparati process information about a world that does not exist

Problems with Endurance:

Endurance theories have trouble dealing with what is now commonly referred to as the problem of temporary intrinsics. When things persist over time there are often changes in their intrinsic properties.[25] For instance, Sylvia is a straight shape in the evening while she lies in bed, but she is later a bent shape when she later sits down for her morning coffee. In this case, Sylvia's shape changes from being straight to being bent. The problem arises about how an object can have two different, and contradictory intrinsic properties. The kind of properties that are of concern here deal with a thing independent of anything else. Shape and height are examples of intrinsic properties. Someone's height describes them independently of anything else in the world. In contrast, extrinsic properties are features which something might have based on some other aspect of the world. For instance, the property of being taller than or the property of being an aunt or an uncle are dependent on certain aspects in the world. Being an aunt or an uncle depends on having a nibling. You might be taller than Peter Dinklage, but shorter than Lebron James, but how tall you are does not depend on who you stand next too.

Note that there is no problem of temporary extrinsics, there is only an issue with temporary intrinsics. It is simple to explain how a thing can have contrary extrinsic properties at different times. For instance, Mark becomes an uncle because his sibling has a baby. Nothing about Mark himself has changed, rather a change in the world, the birth of his nibling, explains why he is now an uncle whereas before he was a non-uncle. Mark's relationship to certain things in world changed, and these explain how he can have different temporary extrinsics. Mark's relationship to the world was different at different times. Extrinsic change does not raise the same problem as intrinsic change as you can have a relation to X and fail to have the same

[25]Lewis, David (2002). Tensing the Copula. *Mind* 111 (441):1-14. p.429

relation to Y so long as they are distinct. Mark can be a non-uncle on Monday and an uncle on Friday, but saying that Mark is both six feet tall and not six feet tall immediately raises a problem.

Perdurantism has little trouble resolving the problem of temporary intrinsics. The perdurance solution is simply that the temporal parts that constitute Sylvia in the evening were straight and the temporal parts in the morning were bent. The temporal parts at different times had different intrinsic properties. If you were to look at the time-slice of Sylvia in the evening, you would find her to be straight. Likewise, if you were to look at the time slice of Sylvia in the morning, you would find her to be bent. Since Sylvia's temporal parts had different properties at different times the perdurantist has no trouble saying that Sylvia had different intrinsic properties at different times.

Endurantism generates some trouble here. Since the theory claims that persisting objects are wholly present at different times, the endurantist needs to explain how the very same thing can have different intrinsic properties. The straightforward solution for endurantism has been to claim that there are no temporally intrinsic properties. Instead, what we typically think of as temporary intrinsic properties are actually relations to time. So Sylvia would bear the *straight-at* relation to the evening and the *bent-at* relation to the morning. There is no worry in explaining how one thing can bear different relations to different things, just like extrinsic properties. There is no trouble in explaining how I am older than my younger brother and not older than my older brother.

This solution does commit the endurantist to denying that something can have certain intrinsic properties *simpliciter*. Nothing could just be *bent* or *straight* it has to be *bent* or *straight* at a particular time. At face value this seems troubling, as it seems like intrinsic properties are something an object just has without respect to anything else. If you look at mathematical

objects like a sphere and say something about its shape, it seems like we are saying something about just the shape of a sphere and nothing about time. If somehow we could look at the world from an atemporal perspective, the sphere would be a sphere *simpliciter*, with no needed reference to a time. The endurantist's solution to the problem of temporary intrinsics precludes us from having intrinsic properties *simpliciter* which seems to be a rather absurd view. The endurantist may respond by noting that this is not an argument, but rather, an assertion that certain properties like shape exist *simpliciter*. It may very well be that this is not the case, in which instance it is not a departure into the absurd to say that something cannot have its shape *simpliciter.*

Like the truthmaker argument against presentism, the strength of this objection to endurantism rests on what language is like. The endurantist is disadvantaged in the same way that the presentist was disadvantaged in defending backward and forward-looking properties. The perdurantist has greater flexibility and simplicity in describing the world. They can say both that an object is a sphere *simpliciter* and that an object is a *sphere-at-t.* The endurantist can only say the later. Furthermore, the idea of having a property *simpliciter* seems like a Moorean fact. It seems like we know that there are certain properties which can be had just by themselves without any relational component; we know this more than the premises of the argument to the contrary. Of particular relevance here is that the endurantist's response to the problem of temporary intrinsics does not provide an account for why having a property *simpliciter* is impossible besides the fact that having a property *simpliciter* is incompatible with endurantism. The existence of the *bent-at-t* relation is something deducible from the existence of something being *bent simpliciter* and existing at *t*, but its existence itself does not provide an argument against the existence of the property *simpliciter* in the first place. The onus here is on the endurantist to provide an argument against *simpliciter* in the first place besides that it makes

trouble for its theory. After all, there are compelling reasons to preserve it, chief among them, that we seem to already know it to be true even before thinking about different theories of persistence.

One approach an endurantist might pursue would be to levy a similar objection at perdurantism; they too cannot say that things have shapes *simpliciter*. The perdurantist solution states that different temporal parts have different shapes, but the shape of the thing itself, the worm, does not seem to have its shape *simpliciter*. It has its shape while being a certain time-slice. The perdurantist could bite the bullet here, but note that the four-dimensional worm has its shape *simpliciter* (albeit a four-dimensional shape), but that particular time-slices do not. The advantage of this response is that it preserves a notion of *simpliciter*, albeit stretched out over four-dimensions. This is also a spot in which the stage-view might prefered over the worm-view.[26] The objection falls apart since the object is the different temporal parts at different times. This means that at a particular time when the object is a certain stage, that stage has its shape *simpliciter*.

There are some properties that clearly seem monadic and can exist *simpliciter*. For instance, the property of living a certain amount of time or an electron having a certain charge. Over the course of the existence of these objects they just have these properties. Note that it is not incorrect to also say that an electron has a negative charge at a certain time, but it also still has a negative charge *simpliciter.*[27] These properties are thought to be essential properties and the endurantist can still claim that they can be had *simpliciter,* since they never change. Essential properties are those properties that an entity could not be without. For instance, an

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[26] Sider, Theodore. "The Stage View and Temporary Intrinsics." *Persistence: Contemporary Readings*. Ed. Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print.

[27] The perdurantist explanation of this is that the electron-worm has a temporal slice at that time and that temporal slice has the charge *simpliciter*.

electron must have the property of having a negative charge. A person might have a different shape; the fact that they have one shape or another is an accidental feature of the world. Persons could be other shapes and still be persons, but electrons could not have a different charge and still be electrons. This response might be extended to claim that only those properties which are essential can be had *simpliciter*. It makes no sense to say that Sylvia has a bent-shape *simpliciter* since her bent-shape is an accidental feature of the world. That Sylvia could also be a straight-shape suggests that shape, for Sylvia, cannot be had *simpliciter.* Objects can only have properties *simpliciter* if they are essential to their being. This response highlights a deep conflict of intuitions between the perdurantist and the endurantist.

Some endurantism have tried to incorporate the notion of having certain properties *simpliciter* into their solution of the problem of temporary intrinsics. An object bears a having relation to a property and a time.[28] So Sylvia is bent in the morning since she bears having bentness in the morning. This response suggests that the property, bentness, exists in such a way that exists *simpliciter*, but that things instantiate properties in a three place relation between the thing the property and a time. This response opens up the endurantist to an infinite regress. Whenever the endurantist explains how something has a property, the explanation generates a new property that they need to explain since the objects bears-having to that property. Spelled out:

X has *P* by having *bearing-having-to-P*

... by having *bearing-having-to-(bearing-having-to-P)*

... by having *bearing-having-to (bearing-having-to-(bearing-having-to-P))*[29]

The process repeats *ad infinitum*. The generation of an infinite regress raises the worry that the regress is vicious. If so, then the endurantist cannot preserve having properties *simpliciter* while

[28] Lewis, Tensing the Copula p.432
[29] Lewis, Tensing the Copula p.432

also solving the problem of temporary intrinsics. If instead the regress is virtuous, then the endurantist has no worry, each step of the regress would fully explain the previous steps. The regress seems troubling here as it struggles to make sense of *simpliciter*.

The problem of temporary intrinsics is enough to move away from endurantism. Perdurantism needs to make no such tradeoff between solving the problem of temporary intrinsics and having properties *simpliciter*. Perdurantism is also better able to solve various troubling cases of identity which the rest of this paper will go on to address. I will start by addressing cases of coincident objects and then move on to discussing Sorties cases, most notably the Ship of Theseus. The solution to these problems independently give reason to prefer perdurantism over endurantism. As a general criteria for evaluating solutions to these cases, the metaphysics should be independently motivated and attractive and it should capture our pretheoretical intuitions to the greatest extent possible.[30]

Coinciding Objects

At t_1 there is a lump of clay. At t_2 an artist fashions the lump of clay into a statue. In ordinary life it sounds natural to say that at at t_2 the artist created the statue despite the fact that the artist did not bring new bits of matter into the world. We mean to say something like the artist arranged the lump of clay into the form of the statue when we say the artist creates the statue. The lump of clay still exists, now sporting the form of a statue rather than that of an amorphous blob. How many objects are here? There is good reason to think there is only one object. We ordinarily think that two distinct objects cannot be in the same place at the same time. The lump

[30] If presentism were true endurantists could provide a good solution to the problem of temporary intrinsics. The problem dissipates as the only object or person that exists is the object or person that exists at the present time eliminating the apparent contradiction. But without presentism, this line is not available for the endurantism. For more see: Zimmerman, Dean W. "Temporary Intrinsics and Presentism." *Persistence: Contemporary Readings*. Ed. Sally Anne. Haslanger and Roxanne Marie. Kurtz. Cambridge, MA: Bradford /MIT, 2006. N. pag. Print.

of clay and the statue share all the same atomic parts, every molecule that makes up the lump of clay makes up the statue and vice versa. That suggests they are one and the same thing. They also have the same categorical properties; they have the same shape, mass, color, density, and so on. However, there is also good reason to think there are two objects. Leibniz's law seems to entail that there are two distinct objects present since the lump of clay and the statue have distinct properties. They differ in modal properties. The lump of clay can survive being smashed, but the statue cannot. They differ in historical properties. The lump of clay existed at t_1, but the statue did not. They might also differ in aesthetic properties. The statue is Romanesque and the lump is not.

The lump of clay and the statue are common examples of what can be described as the problem of coincident objects. Cases of coincident objects are pervasive throughout the world whenever something is made up of smaller parts. Instead of talking about a lump of clay and a statue, we could instead talk about a quarter and a zinc-alloy or a tree and wood molecules. Coincident objects are troubling as they present a clash between our ordinary intuition that two things cannot be in the same place at the same time and Leibniz's law. I will go over the argument for there being one object and then the argument for there being two objects. The latter will prevail. Afterwards we will need an attractive metaphysics to make sense of this phenomenon. Perdurantism fills this role quite well.

The resistance to the idea of coincident objects comes from the common intuition that two distinct physical objects cannot occupy the exact same space at the same time. My cup has to be on the table, it cannot be in the exact same place as the table. One thing is here another thing is there. This intuition motivates some of the objections to the idea of coincident objects in the first place. An initial reply to this example may be to posit that there is only one object present at t_2 meaning that the lump of clay and the statue are not two distinct objects. This

response raises the question as to which object, the lump of clay or the statue, is the object present at t_2. Both objects have claim to being the only object that exists at t_2. The lump of clay might be favored because it has existed longer than the statue. Alternatively, one might favor the statue because it has aesthetic properties intended by the artist. However, it is unclear how to adjudicate between the two cases to determine which is the only object present at t_2. The lump and the statue both have equally good claim to being the sole object.

Furthermore, the two objects really do seem to be distinct from one another. Applying Leibniz's Law to the lump and the statue suggests that there are two objects since the lump and the statue have distinct properties. The two have different historical properties. The lump has the property of existing at t_1, the statue does not. The two have different modal properties. The lump, but not the statue, could survive being smashed with a hammer. The two have different aesthetic properties. The statue, but not the lump, is Romanesque. These differences indicate that the lump and the statue are not one and the same object even though they may share all the same parts.

Still this explanation has not left everyone satisfied. Some object to the idea of coincident objects on the grounds that it leads to a bloated ontology, that we wind up counting one object as infinitely many. I believe that this objection can be satisfied by the same appeal to Leibniz's Law, that the lump and statue have distinct properties is sufficient grounds to believe they are distinct objects which pose no risk of hampering parsimony. Additionally, the lump and the statue share all the same parts which helps explain why if the lump weighs ten pounds and the statue weighs ten pounds that when we put the objects on a scale it reads ten pounds rather than twenty. Recognizing coincident objects does not add more things to the world, it just better describes reality.

Others have put forwards a more sophisticated challenge to the idea that there are no coincident objects such as the position advanced by Michael Burke.[31] Burke thinks that examples of coincident objects come up in situations where different sorts of things are in the same place, but that every object has a dominant sort and is just that. By “sort” or “kind” of thing, Burke means objects of different ontological status. For example, an artifact compared to a living thing. Under this framework, it might be said that the statue is the dominant sort of the lump/statue case, and that therefore the only object present at t_2 is the statue The problem of coincident objects is solved insofar as there is only one object present at a given time.

This reply is insufficient for similar reasons as the less sophisticated form of the objection. It seems unclear what the dominant kind is for a particular object. There are often competing, but equally good candidates to be the dominant kind. Take for example a case of a human chess-piece. The bits of matter in this man seem to constitute both a person and a chess piece. A participant in a game of human chess proclaims that “I am a chess piece”. It is true, at this moment in time the person is a chess piece, after all, they are on a chessboard, in a game of chess, and fulfilling every function of a chess piece. But if coincident objects are not possible, then our human-chess piece cannot both be a chess piece and a human at the same time. It seems absurd to say that a person who plays the role of a chess piece is no longer a person, the person themselves would be the first one to deny this fact. Likewise it seems strange to say that at this moment they are not a chess piece, because if they aren’t that leaves, unexplained, how this game of chess is happening. The objector might appeal by claiming that an object’s dominant sort might be determined by its functional role, but the human chess-piece seems to be fulfilling the function of both human and chess piece concurrently. Coincident

[31]Burke, Michael B. "Preserving the principle of one object to a place: A novel account of the relations among objects, sorts, sortals, and persistence conditions." *Philosophy and Phenomenological Research* 54.3 (1994): 591-624.

objects may have multiple functions at the same time, such as a statue that is also a column. It has both aesthetic and architectural functions, neither of which clearly trump the other in importance. The spectre of arbitrariness seems to linger whenever we try to deny the existence of coincident objects. Worse even, there are cases of coincident objects of the same kind like in instances of fission or fusion which I will deal with later on in this section.

A second approach towards denying the existence of coincident objects would be to deny the existence of complex objects altogether. Call this view the nihilist position. Under this view, the only objects which exist are the mereological simples. In the case of the lump and the statue, the nihilist thinks that the only objects that exist are their constituent fundamental particles. There is no such object that is a lump, a statue, or any other composite like tables or chairs. All that exists are particles. There is no puzzle surrounding coincident objects because there are no objects to coincide. This view raises an immediate objection from ordinary life, we think that complex objects like lumps and statues exist. Talk about lumps and statues makes no sense if lumps and statues do not really exist. The nihilist explanation for how we talk about complex objects is to say we paraphrase, when we speak of a lump of clay we really mean to say something about a bunch of particles arranged lump-wise. The nihilist approach is compatible with both endurantism and perdurantism, but in both cases, it comes at the cost of denying the existence of complex objects. I find that cost to be too great, especially when there are other ways to deal with coincident objects.

One final way to undercut the motivation for this objection is to note that the concept of coincident objects can fit into our ordinary worldview. Context typically determines how we might think about a particular object. When we visit an art museum we think of the object we see as a statue and ignore the possibility that it might also be a lump of clay. The fact that we ignore one of the objects present does not mean it does not exist, and since people can only think of so

many things at any given time, it seems quite natural to let context determine what we consider particular objects to be in the course of everyday life without making a metaphysical commitment.

The Perdurance Explanation of Coinciding Objects

Temporal parts are quite handy to dealing with coincident objects. Cases of coincident objects involve two distinct objects with overlapping temporal parts. Just like two rooms might share the same wall, two objects might share temporal parts. Applying this to the lump and the statue, they have overlapping temporal parts that make up the same four-dimensional object. To further illustrate this, say the lump is still turned into a statue at t_2 and is then smashed back into lumpiness at t_3. The perdurantist would think that the series of time-slices from t_1 to t_3 and onward all constitute the object we call the lump. During the time the statue exists from t_2 until t_3 the parts that make up the statue overlap with the parts that make up the lump.

Temporal parts are also useful in explaining other examples of coincident objects. For instance, there are cases where two distinct objects become one object. Call this process fusion. Or the reverse case, when one object becomes two distinct objects. Call this process fission. Science-fiction offers many good examples of this phenomenon, whereby some bizarre circumstances people are split apart or fused together. The world of business offers more natural examples of these phenomenon whenever companies merge or fracture on a regular basis or one might look at a nuclear reactor or star to see fission and fusion of atoms respectively. To illustrate fusion, let's say two people, Fred and Ed, are taken by a mad scientist and fused together to form a person Ted. Ted is a composite of both Fred and Ed, a mix of all things that constitute their persons, mind, body and so on. Both Fred and Ed have special reason to care about what happens to Ted. They would recoil in horror at the prospect of Ted

being tortured in a way different from how they might respond to the prospect of a complete stranger being tortured. In short, Fred and Ed have a vested interest in what happens to Ted that they do not have for a complete stranger. Likewise, Ted has special reason to care about Fred and Ed. Ted might regret certain actions of theirs. However, Fred and Ed have no special aversion to the prospect that the other might be tortured, or feel paging regrets about past actions of the other. Start with Ted and reverse the process to get an example of fission. The mad scientist starts with Ted and splits him into two people Fred and Ed. Both of these are cases of coincident objects. In both cases, Fred and Ed overlap with the existence of Ted, but they do not have any overlap with each other. The overlap looks much like a two roads merging (in the case of fusion) or a fork in the road (in the case of fission). It should be noted that these fusion and fission examples deal with only one kind of thing, that is persons.

The Endurantist Explanation of Coinciding Objects

Unlike the perdurantist, the endurantist does not have a clear way to deal with coincident objects. Some deny their existence, but for reasons already stated I think that position is untenable. Endurantists have come up with a bevy of different options, each with particular costs, to try and solve the problem. I will look at a few of them that seem to be the most prominent in the literature.

The first option is sometimes referred to as the standard account. It explains coincident objects by allowing that two different objects can wholly occupy the same position at the same time by way of a constitution relation.[32] Proponents of this view make a distinction between constitution and identity. For instance, the lump constitutes the statue, but is not identical to it.

[32] Wiggins, David (1968). “On Being in the Same Place at the Same Time.” Philosophical Review 77: 90–95. Reprinted in Rea 1997: 3–9.

Constitution, unlike identity, is an asymmetric relation. The lump constitutes the statue, but the statue does not constitute the lump. Coincident objects are explained as objects of different metaphysical kinds. The formal presentation of this solution as presented by Wiggins is:

> "No two things of the same kind (that is, no two things which satisfy the same sortal or substance concept) can occupy exactly the same volume at exactly the same time."[33]

Perhaps the ideal example of this mode of coincidence could be seen at a world where there are different kinds of substances that do not causally interact. Take a world with physical bodies and non-physical souls.[34] Physical bodies and souls are two different kinds of non-causally interacting substances. As such, it is simple to think about how souls could occupy the same space as a physical body at the same time. Likewise, physical objects could coincide if they are composed of different kinds of matter that do not interact. It does not seem that this can apply to the lump and the statue as they are both made up of the same kind of physical substance.

One might still try and resolve the case of the lump and the statue this way, but they would run into an immediate problem of having to divvy up the lump and the statue into different kinds of substances. This solution runs the same risk of arbitrariness as the view that objects only have a dominant kind. The lump and the statue both have an equally good claim to being the same kind of substance, that is physical matter. To say that the lump or the statue is a different kind of substance would require appeal to some other type of property, for instance function, to determine the kind of substance an object is, but this seems like a peculiar way to classify objects. There doesn't seem to be a non-arbitrary way to determine which of the lump or the statue is a different kind of substance.

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[33] Wiggins, p 93
[34] Lewis, On the Plurality of Worlds, p.204

The constitution view also has a problem when it comes to the supervenience of properties on micro-physical parts.[35] The lump and the statue share the same matter and have many of the same properties such as weight, height, and so on. But, the two still differ in some respects. For example, the two differ on their historical and future properties, as well as on their modal and aesthetic properties. It seems as though these kinds of properties ought to supervene on the object's micro-physical properties. What the statue was, could, or will be like is fixed if its microphysical properties are fixed. However, the lump and the statue share the same categorical properties, but differ with respect to the other kinds of properties. Formally:

1. An object's properties supervene on its microscopic parts.
2. The lump of clay and the statue share all the same microscopic parts
3. The lump of clay and the statue have different non-categorical properties

Something is missing from this picture to explain how (1), (2), and (3) can all be true, since (1) and (2) imply that the lump of clay and the statue would have the same non-categorical properties, but they do not. Note that this objection only has force against the endurantist if there is value to the supervenience claim. I think there is, insofar as it is how we ordinarily ascribe certain properties to objects. For the endurantist who wishes to keep the supervenience claim, they need to find a way to ground the non-physical properties in the physical. The challenge is to explain what accounts for the non-supervenience of the non-categorical properties. One attempt is to claim these properties are relational facts about the object. The statue might have an aesthetic property by virtue of being part of the artworld. This response is problematic for much of the same reasons offered in dealing with the problem of temporary intrinsics. This approach denies the existence of certain intrinsic properties *simpliciter*. The aesthetic value of the statue is relational, between the statue and the artworld, and not

[35] Rea, Michael C. "Supervenience and co-location." *American Philosophical Quarterly* 34.3 (1997): 367-375.

something had just by the statue.[36] These objections aside, the view also has an inability to deal with cases of coincident objects of the same kind like cases of fission or fusion.[37] Ted, Fred, and Ed are all certainly the same kind of thing and as such, appeal to this solution fails to explain their coincidence.

A second option is presented by Judith J. Thompson.[38] Her idea is that coincident objects are both wholly present and engage in mutual parthood. This is a variation on the standard constitution view. The lump and the statue are both wholly present and have the same parts. However, the two objects have different different ontological relations to their common parts. The clay is tied closer to its parts than the statue. Say the arm of the statue is broken off and replaced with another arm made from a different lump of clay. It seems correct to say that the new statue is identical to the old one, as objects can survive loss or changes of minor parts. But, the original lump of clay is now scattered. The statues parts changed, but the same statue remains, but the lump's parts could not have been changed and still have the same lump.[39]

This view has similar problems in grounding properties, but unlike the standard view seems to be better able to deal with cases of coincident objects of the same kind. In cases of fusion and fission, Fred and Ed share Ted as a common part. The view does come at a cost of rejecting the idea that mutual parthood implies identity.[40] That if X is a part of Y and Y is a part of X, then X and Y are both proper parts of each other.

A third option is to think of identity as temporary. The lump and the statue are identical once statue comes to exist, but the lump was not identical to the statue prior to its creation.

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[36] Wasserman, Ryan, "Material Constitution", *The Stanford Encyclopedia of Philosophy* (Spring 2015 Edition), Edward N. Zalta (ed.), <https://plato.stanford.edu/archives/spr2015/entries/material-constitution/>; Sider, Four-Dimensionalism, p. 158

[37] Sider, Four-dimensionalism, p.155

[38] Thomson, Judith Jarvis. "The Statue and the Clay." *Noûs* 32.2 (1998): 149-173.

[39] Thomson, p.157

[40] Sider, Four-dimensionalism, p.155

Likewise, if the statue were to be destroyed, the lump would no longer be identical to the statue. This option presents a rather large departure to how we traditionally think of identity. Identity seems to function bimodally, something either is or it is not identical with something else. Temporary identity runs counter to this conception of identity. Furthermore, this solution gives up some of the reflexivity typically attributed to the notion of identity. The lump at t_1 and the lump at t_2 are identical. The lump at t_2 is identical to a statue, but the lump at t_1 is not. There appears to be a difference between the lump at different times, which leads us either back to the problem of temporary intrinsics or towards denying that the lump is identical to itself at different times.

Temporary identity also conflicts with Leibniz's law in two distinct ways. First, there are cases of objects which share the all same properties, but nonetheless are notidentical since identity is temporary. Second, there are cases where objects have different properties, but are considered identical.

A fourth option is to embrace the position of mereological essentialism. This view claims that an object's parts are essential to it. Chisholm presents the view as "for any whole x, if x has y as one of its parts then y is part of x in every possible world in which x exists."[41] Every object necessarily has the parts it has. The lump and the statue are both constituted by the same parts (clay molecules), but are themselves not identical with each other.

This solution has great bearing on the persistence of the clay molecules over the course of this process. They undergo a change in shape, from lump to statue. At one point they are arranged lump-wise and at another statue-wise. According to this view they do not persist over time after they undergo change. More broadly this happens whenever objects change shape. Chisholm explains, "if a thing changes it shape, then it loses a part. If it changes its shape, then

[41]Chisholm, Roderick M. "Parts as Essential to Their Wholes." *On Metaphysics*, NED - New edition ed., University of Minnesota Press, 1989, pp. 65–82, www.jstor.org/stable/10.5749/j.cttts76h.10. p. 582

some parts that were joined together will no longer be joined together and therefore the part that they made up will have ceased to be."[42]

The trouble with this view is that it runs against our ordinary view about persistence. According to this view, strictly speaking, objects do not survive a change in their parts. There is an immediate worry in how we talk about ordinary objects, which quite often undergo small changes. Chisholm draws a distinction between persistence in the strict and philosophical sense and how it is used in the loose and popular sense.[43] In this way we can preserve our talk about objects which undergo small changes since the objects before and after the change are sufficiently similar. This doesn't strike me as how people talk in ordinary life, when we refer to objects that undergo small changes we mean to make reference to the exact same object. Worse than the linguistic consequence, the departure from persistence as we typically know it is reason enough to seek refuge elsewhere.

Sorties Cases

The next set of cases I'll look at are instances where identity seems to be vague due to gradual changes. The Ship of Theseus is the historically prominent example of the problem concerning the identity of material objects over time. These examples are troubling since our understanding of identity seems to include the following: (1) objects can survive a small change in their parts; and (2) that identity itself is transitive. If A is identical to B and B is identical to C then A is identical to C. Transitivity is an essential part of the notion of identity.

Now to outline the case of the Ship of Theseus. The Ship of Theseus is undergoing maintenance. One of its original planks is rotten, so it is removed and replaced with another wooden plank. Presumably, the Ship of Theseus exists after the removal and replacement of

[42] Chisholm, footnote 10, p.601
[43] Chisholm, p. 602

one plank. The “Ship of Theseus minus one plank” is still the Ship of Theseus. The process continues one plank at a time until all the original planks have been replaced. The example raises the question, at which point (if any) is the Ship of Theseus no longer the same ship? By (1), if the ship can survive small changes, like the removal of one plank,[44] then it is still the same ship after one iteration of the process. By (2), the transitivity of identity indicates that the original ship without any replacement planks is the same as the ship that has had all its planks replaced. To make matters more difficult, take all the original planks and puts them back together into form of a ship. It seems as though there are now two candidates for being the Ship of Theseus, the ship built out of replacement planks and the ship built out of original planks, both of which have claim to being the Ship of Theseus, but are not identical to one another. After all, they are two distinct objects in the world.

Call the ship rebuilt from the original planks, “O” and the ship made out of the replacement planks “R”. This leaves four options to determine which, if any, is the Ship of Theseus: “O” is the Ship of Theseus, “R” is the Ship of Theseus, both “O” and “R” are the Ship of Theseus, or neither “O” or “R” are the Ship of Theseus. The first two options both claim that one of “O” or “R” is the Ship of Theseus, but since they both have claim to be the original ship there needs to be a non-arbitrary way to adjudicate between the two ships. There does not seem to be a clear way to do this. One might argue “O” is the Ship of Theseus on the grounds that it is made up of the original planks and since those original planks were the Ship of Theseus so too is “O”. Similarly, one might argue “R” is the Ship of Theseus on the grounds of the transitivity of identity in the replacement process. Since removing one plank doesn’t destroy the Ship of Theseus (S), then that means that the Ship of Theseus minus one plank (S-1) is still

[44] For those people who are worried that the loss of a plank is too big of a change, the example can be easily modified to be a loss of an even smaller part, a molecule, atom, a quark, so that its loss doesn’t destroy the ship.

the Ship of Theseus. S=S-1. For the same reason we can conclude that S-1=S-2 and by transitivity S=S-2 and so on until you get to “R” which is the Ship of Theseus minus n planks (S-n). Both of these options are appealing in different ways, but there does not seem to be a clear way to preference on over the other. “R” is appealing since it relies on the transitivity of identity. “O” is appealing since it relies on the principle that taking something apart and putting it back together again does not destroy it. A watchmaker who takes apart their stopwatch to see all of its gears and then puts it back together again does not think they have generated a new stopwatch. The same might be said of “O”. The third and fourth options claim that there are either two Ships of Theseus or that there are none. Both are both troubling for the same reason. There is only one original Ship of Theseus, but these options posit that there are two or zero such ships. Saying there is no Ship of Theseus is straightforwardly problematic, we started with one, so if it disappeared where did it go? Likewise, it is strange to say there are two Ships of Theseus, as we started with only one. Maybe we could reconcile part of the problem in other ways, maybe legally they are both owned by x, but this does not solve the metaphysical problem of the ship's’ identity.

A version of this problem can be constructed in parallel to apply to persons. The most straightforward comparison can be had with a view of personhood that reduces persons into physical objects. Take for instance the position that claims that a person’s identity is their body. This viewpoint claims that the contiguity of personal identity depends on the person’s physical parts. The various bits of matter that compose our bodies also undergo gradual replacement. The atoms that make us up change over time, one carbon atom for another, and these two could theoretically be taken to construct another person. Likewise, the problem can also be generated for other conceptions of persons.

The Perdurance Solution

Temporal parts offer a good solution to the problem. Take the initial formulation of the Ship of Theseus problem. A perdurantist would explain the Ship of Theseus example by noting that the Ship of Theseus has different temporal parts at different times. There exists a four-dimensional Ship of Theseus "worm" and the various stages of the replacement process are different time slices of that worm. During the replacement process the temporal parts of the original Ship of Theseus and its replacement planks coincide.[45] Likewise, the issues raised by introducing "O" and "R" can be similarly explained. The Ship of Theseus case of fission is like the example of Ted, Ed, and Fred in the previous section. There is a "Y" shaped branching pattern with "O" being one branch and "R" the other. "O" is one branch of the worm plus the leg of the Y and "R" is the other branch of the worm plus the leg of the Y. "O" and "R" initially coincide, the leg is a common part of both, but they later diverge. This dispels the metaphysical worries about the Ship of Theseus. Any remaining questions that might arise about the identity of the Ship of Theseus are pushed into other areas like the law, and do not pose any trouble here.

Related to the Ship of Theseus is a whole class of cases susceptible to the Sorites paradox. Sorties case might be spelled out as follows: for any N, if N grains make a heap, so do N-1. The classic formulation of this problem involves a heap of sand. Someone comes and removes a single grain of sand from the heap, and then another grain and another until there are no more grains of sand to remove. Surely at the point when the last grain of sand is removed, there is no longer a heap. This means at some point in the process the removal of one grain of sand makes the pile no longer a heap of sand, leading to the question; when does a heap stop being a heap? The same sort of process can be applied to any complex object. For

[45] Ney, Alyssa. "Persistence." *Metaphysics: An Introduction*. N.p.: Routledge., n.d. N. pag. Print. p.176

instance, tables made up of particles which can be removed one by one in the same fashion as the heap. One might gradually remove chips from a table and reach the same difficulty as with the heap of sand. This process occurs naturally over the lifespan of most objects. Small chips might fall off a table over time due to normal wear and tear, which seems to imply that objects like tables are vague objects, that is, that they lack clear boundaries. Where does the table stop being the table? There is a real difficulty here as the Sorites paradox suggests that a vagueness surrounding complex objects in our world in spite of our perceived certainty regarding objects.

Mark Heller breaks down the potential solutions to this problem into a quadrilemma.[46] Option one is that the identity of physical objects really are vague. Tables and heaps exist in the world as vague objects. Option two is that physical objects have precise boundaries and that those boundaries can be known. There are clear points in the chip/grain removal process when tables and heaps cease to be and it is logically possible for us to know what that point is. Option three is that physical objects have precise boundaries, but they cannot be known. There are clear points in the chip/grain removal process when tables and heaps cease to be, but that point is epistemically unavailable to us. Option four is that there are no such objects that are susceptible to the Sorites paradox. Tables and heaps do not exist. Heller proceeded with an argument by elimination ultimately settling on option four. I will argue in favor of a fifth option, that physical objects have precise boundaries which can be known depending on context. There are clear points in the chip/grain removal process when tables and heaps cease to be, but circumstances dictate whether or not we can know what those boundaries are. I will provide a brief sketch as to why Heller rejects the first three options, before delving into the problems with Heller's solution and then outlining an alternative.

[46] Heller, The Ontology of Physical Objects p. 74-75

Option one: physical objects are vague. Objects lack clear boundaries; where a chair starts and ends is obscured by a metaphysical murkiness, its boundaries are fuzzy. This position has many problems, chief among them that it runs counter to our ordinary thoughts and that is contradictory on standard logic. This position claims that the objects themselves are vague, in that, the objects themselves have no clear boundaries to distinguish themselves from other objects. At face value, I find it hard to believe that anyone has real trouble figuring out where a table ends and where the mug of coffee they set on it begins. This suggests that at the very least on the macroscopic level there is no real imprecision in nature.

The vagueness of this kind only seems to rear its head on smaller scales. No one claims that their chair is determinate to a specific nanometer. That leaves any possible imprecision in nature to exist on a smaller level, but this is also unconvincing. The vagueness that might be found on these smaller scales is not a metaphysical vagueness. A grain of sand (or any other small particle) either exists or it does not exist. If we were so inclined we could go and count how many grains of sand are in a particular heap and in doing so we would verify there was no imprecision in that bit of nature. There is no question that those bits are there, there is nothing vague about them in the metaphysical sense. Any vagueness that persists must be of some other variety (linguistic, epistemic, etc.)

Secondly, the position leads to contradiction. Take the sentence “a table can survive the removal of a one chip.” The sentence cannot be true at every stage of the chip removal process, as when the last chip is removed there is surely no more table. So there must be a stage in the process where the statement and that statement is the boundary between table and non-table.[47] If tables were vague, then they would be no clear boundary between table and non-table. Therefore physical objects are not vague.

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[47] Heller, p. 76

Option two: physical objects have precise boundaries that can be known. Heller rejects this position since, as a matter of fact, we do not know the boundaries of physical objects and we could not know them. We do not know the boundaries of physical objects because people have not measured them. Even if we had more information about the objects or all the scientific information about a table, if we were to observe a table being dismantled chip by chip we would not be able to determine exactly when the table ceased to be. If we could know the boundaries of the table, Heller thinks we would be able to determine when the table ceased to be. Heller highlights this difficulty by challenging people to observe the chip removal process and then figure out when the table cease to exist.[48] Participants in this thought experiment are asked to observe the Sorties process, and are given all the relevant information about the object at each stage and produce an answer. I offer some qualified agreement with Heller here. The challenge he offers observers of the Sorties process suggests that they can not determine the boundaries of physical objects. However, the failure for people to know the boundaries of a table when faced with the Sorties process does not mean that someone cannot know the boundaries of table in other contexts. I will elaborate on this point when discussing option five, but the difference between Heller's assessment and my own relies on a different conception of knowing. At the very least, I agree with Heller that it might not always be possible for someone to know the precise boundaries of physical objects, in particular, when pressed with the Sorites paradox itself.

Option three: physical objects have precise boundaries that cannot be known. This position claims that the vagueness about an object's boundaries is due to epistemic failures. Heller reverses the Sorties process to argue against this option. Suppose that instead of dismantling a table chip by chip, instead you tried to assemble a table chip by chip. Start with

[48] Heller, p. 88

one chip and keep adding them until you reach a point at which you have a table. At a certain point, the chips will be sufficiently table-like that people know that it is a table, at which point they have a clear idea of the table's boundaries. Heller believes that:

> "If all the evidence we might have for where the boundaries of an object are would not be enough to allow us to know where the boundaries are, then all evidence we might have have for where the boundaries are not should not be enough to yield knowledge of where the boundaries are not. If our possible information would be insufficient for knowledge of the cutoff point between when a thing exists and when it ceases to exist, then the same type of information should also be insufficient for knowledge of when a thing continues to exist."[49]

The fact that people do know when a table continues to exist then is evidence that suggests that the boundary of the object can be known contra option three.

Option four: physical objects susceptible to the Sorites paradox do not exist. According to Heller's ontology, the only objects that exist are four dimensional hunks of matter. Four dimensional hunks of matter are not susceptible to the Sorites paradox insofar as they cannot be broken down bit by bit as they are extended across four dimensions (they are worms). These are the only real objects that exist. For a non-temporal parts theorist, the only objects that exist would be their mereological simples, smallest parts of objects they include in their ontology. What we typically think are objects, things like tables and heaps, are explained as certain categorizations we impose on the world. One way to explain this confusion in our typical talk of objects is to describe them as paraphrases. When we talk of tables we don't really mean to refer to tables as a distinct object in the world, rather we are really referring to four dimensional hunks of matter arranged tablewise.

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[49] Heller, p.92

This position seems troubling insofar as it seems like a Moorean fact that ordinary objects like tables exist. No ordinary person when they speak of tables and chairs really means to refer to four-dimensional hunks of matter. Our ordinary understanding of the world provides an epistemic reason to doubt option four as I know no one that seriously thinks that tables do not exist. There are further problems with the position if you adhere to the position of mereological universalism, that is, the idea that every mereological part in the universe automatically fuses with every other part and every collection of things fuses with every other. With this view in mind, there exists a fusion for every collection of particles that composes the table as well as fusions for every collections of particles minus one, every particle plus one, and so on. That means, there exists a fusion of particles for every stage of the Sorties process as well as fusions for objects with every particle in the table along with some extra. From here it seems that if these fusions exist then it lends credence to idea that there are objects more complex than just hunks of matter - the various fusions of particles. Heller might reply by denying mereological universalism however, the argument as it stands suggests that Heller's argument by elimination was not exhaustive and that another possibility might prevail.

Option five: There are physical objects with precise boundaries, and they can be known or not known depending on context. The metaphysical part of this solution claims that complex objects like tables exist. Return to the table. The Sorites paradox makes us question whether the table minus a chip is still a table, and then table minus two chips and so on. Call the table before chip removal Table, and table minus a chip Table_{-1}, and Table minus two chips Table_{-2} and Table minus *n* chips Table_{-n}. Some of these table candidates are clearly not tables, like the Table minus all its chips (which is nothing at all), but there is a broad set of potential candidates that should qualify as a table. We could admit that all of these potential candidates are the table, that is to say that Table, Table_{-1}, Table_{-2} and so on for those candidates that are sufficiently

table-like are all tables. This solution would admit that there are many different tables concurrent with each other. Unlike the problem of coincident objects, there is a unique problem here when we say things like “dinner is on the table” as we mean to refer to one particular table, but there are many tables that dinner is on. The vagueness present is about which candidate table is the one we are referring to.

A method of supervaluationism is useful here. This method relies on a different conception of truth from truth *simpliciter*. Lewis provides an explanation, “Call a sentence super-true if and only if it is true under all ways of making the unmade semantic decisions; super-false if and only if it is false under all ways of making those decisions; and if it is true under some ways and false under others, then it suffers a super-truth-value gap.”[50] Each interpretation of “dinner is on the table” puts points to one candidate table and excludes the rest. It matters little whether or not that candidate table is Table or Table$_{-n}$ so long as the candidate is a sufficient table candidate by being in form and/or function, table-y enough. So long as at least one table candidate is good enough the sentence can be true. The supervaluationism approach does not tell us which table candidate is the referent of our sentence, but this is not all that problematic. The referent, whatever it might be, merely points out a particular set of chips that is sufficient to be called a table. Insofar as that is the case, it can be said that complex objects do exist. This allows us to say that the sentence “there is one table” is super-true because it turns out true on every precisification. Then if truth is identified with super-truth, what we can say is just true.

One might further object that this process is arbitrary. Such an objection would be correct, but arbitrariness, in this case, is not pernicious. It is dictated by context. It has the advantage of not being anthropocentric in the sense that it can be used to make sense of

[50] Lewis, David. "Many, but almost one." *Ontology, causality and mind* (1993): 23-42.

complex objects regardless from any subject's point of view, but it also has the advantages of anthropocentric views insofar as the ordinary contexts are driven by human minds and unsurprisingly point out objects which we typically think exist. If Martians instead were to examine the object we call a table they might have a different semantics to make sense of this bit of matter. They might, for instance, have terms like "intable" to refer to tables that are indoors or "outtable" that refer to tables that are outdoors whereas we refer a table in either of those contexts as just "table".[51] The terms "intable" and "outtable" certainly sound strange to us, but Martians might have good reason to use these terms (maybe the complexity of Martian zoning laws makes the distinction between "intable and "outtable" necessary). We make a similar distinction between molten rock depending on if it is inside the Earth's crust (magma) or outside it (lava). The confusion we might have in conversing with Martians about tables is not about whether or not complex objects exist, but how to make semantic sense about those objects.

Even with supervaluation in mind, if pressed with Heller's experiment to observe the Sorties process and report back on the object's boundary, it still seems difficult to know where the line between candidate and non-candidate tables lies. The second-order vagueness here is that the line between vague and non-vague is, itself, vague. I believe this second-order vagueness that arises from the Sorites paradox, is best serviced by the position of epistemic contextualism. To claim that someone knows the boundary of a table depends on the context the subject finds themselves in. In dealing with Sorties cases, I believe that people in ordinary life know where objects start and end, but when pressed with Heller's challenge to observe the deconstruction of objects people might not know the boundaries of the same object. The standard for what constitutes having knowledge depends on context. The standards are more relaxed in ordinary life and more stringent in philosophical contexts. Say for instance you are at

[51] Hirsch, Eli. *The Concept of Identity*. New York: Oxford UP, 1982. Print. P.32

a coffee shop with your friend Mark talking about basketball. You would know all sorts of things, like the fact that you were at a coffee shop, you are with your friend Mark, and that you were talking about basketball. However, if you were instead at a coffee shop with René Descartes talking about evil deceivers (or some other skeptical scenario) you might very well not know the same sorts of things as you did when you were at the coffee shop with Mark as you are now confronted with a higher standard for what it means to know. The upshot of this is that people might know or not know the boundaries of the very same object in different contexts. Note this move is quite like the move the nihilist makes in distinguishing between our ordinary language and a strict and proper language.[52] The nihilist claims that context determines which of the two languages we speak. My claim is that instead of switching between one language and another, "knowing" has an implicit contextual component like how the of the words "I", "here" and "now" refer to different things depending on the situation.

In ordinary life there is only one possible candidate table. The possibility of the various Sorties cases do not arise. No one wonders if they are eating dinner on Table-1 or Table-N, they think it is only possible they are eating dinner on their table. But when pressed with the Sorites paradox, then those other possibilities arise and need to be attended to. The Sorites paradox does not introduce any new metaphysical confusion, it does not introduce new objects into the world once it is mentioned. The Sorites paradox introduces epistemic confusion, and that confusion can be resolved.

First more on epistemic contextualism. Much of our talk implicitly makes reference to particular contexts. For instance, if you were at party and looked in the fridge and said "There is no more beer" no one thinks you mean that there is no more beer left in the universe. You mean

[52] Chisholm, Roderick M. "Parts as Essential to Their Wholes." *The Review of Metaphysics*, vol. 26, no. 4, 1973, pp. 581–603. www.jstor.org/stable/20126296. p.586

something like there is no beer in the fridge. There are many different mechanisms that philosophers have proposed to figure out how context affects knowledge. I will stick to the position as presented by Lewis, but other mechanisms could function just as well to resolve the Sorites paradox. Lewis presents his form of contextualism as, “S knows that P iff S's evidence eliminates every possibility in which not-P - Psst! - except for those possibilities that we are properly ignoring.”[53] The possibilities that S needs to eliminate are the relevant alternatives Lewis provides seven rules for determining the relevancy of a possibility in a context.[54] For example, take the case of a party where a person says that “there is no more beer”, Lewis would explain the correctness of the statement by noting the person knows there is no more beer because they are properly ignoring all the possibilities where there is more beer, such as the true possibility that beer exists outside the party or the possibility an evil deceiver is tampering with their senses. If instead of being at a party in ordinary life, and instead this person was engaged in a conversation with an intense skeptic, then the subject would have to deal with the possibility of being in a skeptical scenario and consequently might not know if that there is no more beer precisely because the scenario was brought up to them as a relevant alternative.

Now to apply epistemic contextualism to the Sorites paradox. It has already been noted that the vagueness of the paradox is not metaphysical. The bits of matter that compose a table are present and have sharp boundaries. Likewise, for the mereological universalist there exist many different suitable fusions of those bits of matter that can be considered tables. The vagueness is linguistic, but in ordinary life we properly ignore all but one candidate table. In ordinary life it is not necessary to eliminate all the possibilities where the boundaries of the table

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[53] Lewis, David. "Elusive knowledge." *Australasian journal of Philosophy* 74.4 (1996): 549-567. p.554

[54] Lewis provides seven rules for determining the relevance of a possibility: Actuality, Belief, Resemblance, Reliability, Method, Conservatism, and Attention. However, these rules are not intended to be necessarily unique or exhaustive ways to determine the relevance of a situation. Instead they provide general guidelines about what can and cannot be ignored in a given context. For instance, subjects cannot ignore a possibility that they believe is the case or they can ignore possibilities that concern errors in reliable processes like sense perception.

are unclear if we properly ignore the possibilities where it is unclear. We only attend to the possibility that the table in front of us is in fact a complex object. In this instance we can say that we do know where the table starts and ends. We do this quite plainly. We might point to the edge of the table, we note where the table ends and the cup of coffee resting on it begins, and so on. Since Heller's argument proceeds by elimination of alternatives, but not all alternatives are eliminated (this one) it appears that there can be the existence of complex objects like tables. No one in ordinary life, unless they are a certain sort of philosopher, seriously attends to the Sorites paradox over the course of their day. They do not believe it to be a possibility that might obtain. Furthermore, the process in which people come to know that there are objects like tables is generally reliable sense perception.

What then should we make of Heller's challenge to observe a Sorties case as it happens? In such a situation where we watch a table be dismantled chip by chip it does not seem like we can properly ignore the Sorites paradox. In those situations knowledge about the boundaries of objects seems to disappear. Unless the observer is someone intimately familiar with supervaluationism arguments and their application to particular tables, then they will most likely not know when the table ceases to stand. However, when those people stop conversing with philosophers and return to their everyday life they will regain knowledge about where tables start and end as the Sorites paradox loses it salience. The vagueness generated by the Sorites paradox is not a metaphysical vagueness, but an epistemic one. There are certain situations where the epistemic vagueness dissipates, like in ordinary life, and there are some cases where the epistemic vagueness appears intractable, like when watching the Sorties process happen in front of you. Like the case of the Martian "intable" and "outtable" there is no disagreement about the metaphysical reality our words point out in the world. What differs is the epistemic context in which we make claims. So it can be said that complex objects exist insofar as there is a context

in which we know they exist, but also that what exists are four-dimensional hunks of matter insofar as when pressed with the relevant possibility we know that this is what exists.

Conclusion:

In ordinary life the problem of persistence seems to be nonexistent. We seem to know that objects and persons persist over time. It is the strength of our pretheoretical intuitions about identity and persistence that makes the problem posed by change so troubling. We have a very good explanation for these phenomena, things change over time. That explanation is at the core of all the various plausible accounts of persistence. The combination of eternalism-perdurance theory best explains this straightforward explanation. Better than its alternatives, it captures our ordinary understanding of the world in a way that also accounts for the troubling cases of identity that philosophers find.

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