

CHANGE BECOMES ESSENTIAL

IDENTITY IN A WORLD THAT NEVER STOPS MOVING

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Abstract

The Ship of Theseus example raises problems about the sense that things such as tables and chairs exist and how they are able to change. It challenges traditional metaphysical notions about parthood and identity over time. When analyzed, it turns out that the issues raised by this example are fatal to traditional ontologies. I propose a process approach that does not discard the concept of matter entirely that both conforms to our commonsense intuitions about how the world is and is able to adequately address the Ship of Theseus example. Under my theory, the Ship of Theseus actually includes the process that we would normally call a ship and the system of maintenance that is replacing the parts of the ship. I end by arguing that this is a commonsensical view and respond to objections.

Introduction

In this paper, I will address an ancient problem in metaphysics: the Ship of Theseus. In this example, there is a ship that has parts that are replaced over time, and a new ship is built using the parts that were discarded. The question is which ship, if either, is the real ship of Theseus that was present at the beginning of the story. This example is indicative of a host of problems with traditional accounts of composition and identity. It puts pressure on these accounts by highlighting the problem of change explicitly. One is forced to indicate which ship at the end of the story is identical to the ship at the beginning of the story. There is no intuitive answer to this question that philosophers have agreed upon. Traditional accounts of what kinds of things exist in the universe try to avoid or cope with change. For

substance metaphysicians, who believe that where there is an object, there is a single particular thing to which revisions occur, change is the thorn in their side that cannot be pulled out.

Instead of working against an idea of change, this paper will propose a solution that puts change at the core of what it means to be a particular object. Thus, this solution will be a process, one somewhat in the tradition of Whitehead¹ and Rescher,² though it will be more clearly within a purely analytic framework than these philosophers. I propose that there are two ontologically basic physical types of things in the universe: processes and simples.

This theory's name is *dual complexion process-simple metaphysics*. As the title suggests, the universe is not constituted either just by "stuff," van Inwagen's³ neutrally termed basic physical building blocks of the universe called simples, nor by pure process, as Rescher⁴ proposes. Instead, there are simples that are in motion, and it is the motion of simples in relation to one another that constitute the identity of particular nonsimple things. This theory is motivated by a desire to save commonsense metaphysical intuitions about the world, especially concerning the identity of particular objects and even persons at one time and over time. One might say that the theory developed in this paper resembles an articulated version of a metaphysical view one might get after taking any first year physics class. Though one might take this as a sign of an overly simple and unreflective system, such criticisms in fact only show that I have succeeded in formulating a commonsensical, intuitive metaphysical view. This paper will conclude with responses to expected objections to the process ontology developed.

Section 1: The Ship of Theseus

The Ship of Theseus is an example postulated by the Greek philosopher Plutarch sometime in the first century AD.⁵ He was communicating a legend that had its origins in ancient Greece. In his telling, Theseus's ship was continually maintained by the Athenians for a very long period of time because it was a historical artifact, with many parts being replaced. Ironically, since this possibly historical case was first expounded by Plutarch, the example has grown and been retold and reinterpreted to the point where it only vaguely resembles Plutarch's example. The hypothetical scenario that

I will focus on goes as follows: Theseus owns and operates a ship. Over time, parts of the ship decay at different rates. When one part of the ship becomes nonfunctional, Theseus sells it and buys a new part to replace it. Eventually, there is no material part of the ship has not been replaced. Additionally, the parts that Theseus has been discarding have been bought by a single person, who uses them to construct a copy of Theseus's ship using his original parts. The question is: Which of the two ships at the end of the story has the same identity as the single ship from the beginning of the story?

This example works primarily as an argument against the identity of a thing being the mereological sum of its physical parts. If identity is defined by physical composition, then it is very hard to give an account of replacement of parts. Moreover, Theseus's ship forces the essentialist to answer what connection an essence or essential property has to the material stuff of the world: if an essential property can survive the replacement of matter, then it seems that the property is not supervenient on the mereological sum matter. On this view, either every property essentialist believes in strong emergence about every object or they think the relations between matter produces identity. The position that there is strong emergence of properties fails to be naturalistic, which will be taken here as one criterion for a good metaphysical theory. Naturalism as used here means that supervenience is a given law in the universe: there is nothing physical present at a high level, such as tables and desks, that cannot be wholly explained at a lower level, for instance the atoms that compose the tables and desks. A property essentialist who does not endorse an account of identity that considers the structural relations between parts is forced to this unintuitive and premodern position. This is related to the substance essentialist, whose theory I describe later.

A property essentialist who says that identity supervenes on the structural organization of matter is much harder to argue against. This type of metaphysician might argue that an object is simply the relationships between simples at one moment. Thus, a particular object supervenes on the structure of the simples and an account of their movement is not needed. One version of this theory of composition might be summed up like this: simples compose an object when they are touching each other. This is a theory that van Inwagen⁶ addresses adequately, a view he calls the contact theory of composition. This view has a few serious problems, foremost of

which is that it yields too many entities, many of which are highly unintuitive. For instance, on this theory when two people shake hands they are temporarily one entity. Furthermore, it is not clear in this theory how one can determine where a particular object starts and stops: Does the object that is my body include my clothes and the chair I am sitting in and the computer I am laying my hands on? Supposing gravity waves are real, under this view it might be the case that there is only one single object that exists: the universe in its entirety.

To illustrate the point that an account of identity that does not consider change and time is untenable, imagine a universe where there are simples, but they do not move. It looks something like a photograph: there is no change, nothing is happening. Let's imagine that you can see this world, though of course this would be impossible because there is no light moving on to your retinas and your brain is unable to form mental representations because it too is frozen. In this example you will be a ghost of some kind; it doesn't matter whether ghosts are impossible or not. Also, assume in this example that you do not have any preconceived notions of what a particular object looks like: you are a new ghost born into a static universe. Thus, you will be unable to identify objects because you already know what they look like.

Now, how do you identify what is and what is not a particular object? Surely you can see volume and mass and structure; are any of these enough to constitute an object's identity? Considering density, that is, how many simples there are in a given space, certainly cannot yield a view of what a particular is. A view that uses density as a yardstick for measuring when a thing starts and stops gives a huge number of things where we would normally give one: your body has many different densities within it. This view would say that there is no single object there, but instead there are multitudes. Moreover, this view would incorrectly lead one to identify multiple objects as singular: steel beams stacked on top of one another or lying next to one another are a single thing under this view. Thus, we can reject this view because it does not identify objects in an even slightly intuitive way.

There are several types of structural accounts one might consider: you might adopt a contact view or some sort of view that identifies particular organizations of simples. The contact view has already been considered and discarded, but the structural account is a bit harder to refute. In this account, you might arbitrarily identify

certain relations of simples in space to constitute the identity of a particular. For example, you might say that water is simples arranged in what we in our world would call a hydrogen atom 95.84 pm from an oxygen atom that is 95.84 pm from a hydrogen atom, with a 104.45 degree angle formed (obviously, atoms can be broken down further, I will not go into that here because an analysis at this level is sufficient to illustrate my point). These are, in fact, empirically established facts in the actual world.

However, in the world we are imagining, where there is no movement, how could you have come to the conclusion that this is what “water” means? In the real world, we know these facts because hydrogen and oxygen interact in certain ways. Most importantly, we know that this is what “water” means because we have seen oxygen and hydrogen move around together in a statistically predictable way. Thus, we identify water for exactly the reasons I will propose in this paper: water is identified by simples interacting in a statistically predictable pattern. You, the ghost in still-world, have no criteria for favoring one organization of simples as a particular object over another. Unless you already know what water is, which would be because you have seen it in motion, you have no way of knowing that what you have chosen as water actually is water. In fact, in this hypothetical world, it might be the case that when motion starts simples behave in a way that is strikingly different from how they do in our world, though it is still statistically predictable. In this world, hydrogen and oxygen are chemically neutral toward one another. The structural relationship you identified was a fluke: there happened to be some hydrogen and oxygen at the frozen moment that had that structural relationship but it was by chance. It had nothing to do with how oxygen and hydrogen normally interact. This example has demonstrated that a structuralist account of identity, which includes supervenience accounts, is meaningless unless one invokes process.

Last in this example, one might have a phenomenalist account of identity. Thus, whatever looks like an object to you is an object. The red of the upper right of the desk that is slightly darker than the rest might be one thing, so might the shine on the space bar, and so to the white letter “W” on the keyboard. Already one can see that this view runs into the same problems that the other theories have: one is unable to distinguish in a nonarbitrary manner what is and what is not a thing. It is not clear what the criterion for identity is. Even if you set it a criterion, for instance you might say that only experiences of exactly

the same shade neighboring each other constitute a single thing, then you have a theory of identity that is so unintuitive that it is crazy.

The substance essentialist must convincingly explain what connection the essence has to stuff, especially if, as the Ship of Theseus suggests, the essence is entirely nonphysical. A philosopher who believes in substance thinks that the identity of a thing is distinct from any property it has. For example, the wine that a Catholic drinks in church might actually be blood if the substance of the thing is blood. If a substance can survive a complete physical overhaul, it is very unclear what the connection this essence has to physical stuff. Also, this type of essentialism requires a second substance in the universe “standing behind” the normal stuff of the universe, so Occam’s razor is an effective argument here. The excess of entities postulated by this theory would not be enough to kill it if it had a great deal of explanatory power, but it is also plagued by all of the problems of any universalist account of ontology.⁷ William James effectively argues against this view,⁸ saying that once you have said everything about the properties of a thing there is nothing left to say about it. Hence, postulating a substance that is different from the properties is an extra and meaningless step.

Ignoring the general objections to these theories I have raised, any of these systems could bite the bullet and simply say that the replacement of parts of the ship is a battle that the ship cannot survive. However, this poses a serious problem for believers in personal identity of persons across time: a good deal of the matter in a person’s body is replaced several times throughout the life of the person if he or she lives to an old age. However, it is extremely counterintuitive to say that the replacement of matter constitutes a new personal identity for a person. The problem can be put in modal terms also: I could have eaten soup instead of a sandwich today, giving me a different physical composition, but that would still be me with that different stuff, all other things being equal. I propose that a different kind of answer to this problem is required.

Section 2: Process

My solution, called dual complexion process-simple metaphysics (DCPSM), is to say that it is wrong to think of a particular as a thing that changes. Rather, it is better to think of a particular as a thing

that is constituted by change. In other words, a particular is not a property or essence or collection of stuff, but a process. There seem to be three main types of metaphysical accounts of identity in a world that changes. The first and most popular type tries to avoid change, and was discussed and rejected in section one. The other two varieties of systems make change an essential feature of what it means to be a particular object. Version two is pure process philosophy, in which all that exists is change and there is nothing that is undergoing change. One of the most critical attacks on process philosophy in the analytic tradition was done by Strawson, who claimed that process metaphysics either is incoherent or not functional in determining particulars. His argument says that any time one invokes the concept of a process one also is referring to the thing that is performing the process. For instance, there is no process of running without legs that are performing the action. If there is nothing that fixes the process spatiotemporally, then he says that there is no way of referring to a particular process. Consequently, the first part of the theory, “dual complexion,” is motivated by Strawson’s attack.

My solution is of the last type of accounts, claiming that the universe has two natures: the stuff and the motion of the stuff. Process is an essential part of the universe, but my reasoning is distinct from a pure process approach in that it incorporates matter into a picture of the universe. Thus, it finds a middle ground between the two other types of ontologies. However, as will be seen later, the system in this paper leans more toward the process side of the spectrum: motion and change is privileged over matter in determining what constitutes identity.

I use the word *simple* instead of *stuff* because part of the project of this paper is to provide an account of composition as defined by van Inwagen:⁹ he asks when is it the case that some Xs compose a Y? Xs are the theoretical smallest possible unit of matter, thus the term *simple*. I will return to van Inwagen in the applications section of the paper, though my answer to his composition problem should be clear before then. So, the theory presented in this paper depends upon the interplay between process and simples, but what do I mean by process?

This process philosophy gives a dual aspect view of reality, in which there is some kind of stuff and also processes that emerge from the behavior of the stuff. This account seems circular: it seems that I am saying that process emerges from the process of

stuff. However, I am using “process” as a technical term. “Process” does not refer to just the movement of simples but to the pattern of various movements. At the lowest level of analysis there is only stuff-in-motion. This stuff interacts with itself according to statistically predictable patterns. When one steps back, one can recognize large patterns of interaction. These patterns of interaction are the regular objects of our references. Thus, without patterns of interaction there would be nothing in the universe to be the object of a reference.

A process is defined as a stable pattern.¹⁰ At a low level of analysis, a desk appears to be a “blooming, buzzing confusion.”¹¹ However, this constant low level motion is such that it maintains for a time what we would call a desk at the human level of analysis, or scale. There is an epistemic argument hidden here also: if a thing is not involved in a process, or is at rest, or is incorporeal, then it does not affect a mind. A thing must have noticeable effects to be the object of an experience, and so all things known through experience are processual and causal. References to physical particulars are references to processes. This is not to say that processes are not more real than the stuff that is engaged in the process, though, as just pointed out, stuff must be engaged in a process to be apprehended. Rather, processes are equally real and are appropriate objects of reference.

This simple epistemic claim, that the only way for a simple or collection of simples to be known is if they are in motion and produce effects in our perceptual apparatus, that is, they transfer their energy from themselves to us, could conceivably lead to a stronger metaphysical claim. In the same way that the Cartesian intuition and related arguments move from an epistemic premise to a metaphysical one, one might claim that because the motion of simples is all that can be known, then that is all that there is. In other words, there are no simples; there are only processes. This might be a tempting move for a string theorist or some variety of quantum theorist to make: for the string theorist, all that exists is vibrating energy of some type. However, because Strawson’s argument holds (see the Objections section), simples must be posited at least as a transcendental criterion for reference to objects. Furthermore, even if one holds that the strong metaphysical claim is sound, the theory developed here will still work, except that it will no longer have its dual-complexion aspect and will just be a process theory. I will not dwell on this in this paper.

A typical process might look like this: Let A, B, C, and D be simples-in-motion. A is in motion, while B, C, and D are at relative rest. A hits B and transfers its energy to B, causing B to move. Likewise, B does this to C and C to D. When we refer to the process we are not referring to A or B or C or D but to the energy or motion that connects all of them in a chain of interaction. Of course, matter is necessary for the existence of a process, but it is not sufficient. So, we refer to change and the motion of the matter, not matter alone. Thus, in an important sense the process is not the matter, but is instead riding on the matter. This leads us to an answer to the Ship of Theseus problem.

Section 3: Process and the Ship of Theseus

Both simples and their motion are necessary for there to be a process. However, no particular simples are necessary to the process, whereas particular motion is necessary. The motion, transferred from one simple to another, survives the loss of the simple that it was briefly part of. Thus, a process can survive a replacement of matter because it is not the matter. What counts in determining identity at one time or over time is not the simples but the pattern of motion of them. In considering DCPSM, an easy mistake would be to think that motion and simples are equally privileged in constituting identity, or even that motion is merely an accidental property of the simples. However, this is not the case: it is far more accurate to say that the simples are accidents of motion. Simples get caught up in motion, not the other way around. The Ship of Theseus problem needs a bit more of a nuanced explanation, though. In this example, there is no internal organizing force that replaces the matter of the ship. Instead, there is a system of maintenance, which is Theseus in this example (to make it simpler). There is no simple ship process that has an internal organization that takes in matter from outside itself to replace parts when needed as a living organism does.

My solution to this is to propose that what the Ship of Theseus actually is is the process of the ship, which is simples in a functional ship pattern that sails and does other ship things, in addition to the system of maintenance. In this case, Theseus is the system of maintenance when he is performing the role of ship maintainer. Thus, Theseus is a person and is part of the ship. This has to do with

how processes are singled out: if a person can tell a coherent story about a particular and its changes, then it is an individual process. A coherent story is one in which the interactions between the simples in the story are meaningful: the simples must interact with one another directly. This explanation is a bit opaque; an example of an incoherent story might be one about the tip of my nose plus the Eiffel Tower. We can make statistically likely predictions about each of them, but unless my nose does somehow affect the Eiffel Tower those predictions have no relation to one another. Thus, a coherent story is one that does not include elements that are unnecessary or exclude elements that are necessary.

One might argue that even with this concept of a coherent story one might still get a view akin to universalism: every possible coherent story about a statistically predictable pattern of interaction becomes an object under this view. For instance, one could describe me sitting in a chair as a single process that behaves in a clearly predictable manner, thus it is a particular object. The independence value proposed later will fix this problem. Even more radical: the tip of my nose plus *the air* between here and France plus the Eiffel Tower might be described coherently. My nose does affect air which eventually affects the Eiffel Tower, and vice versa. Thus, these elements interact in a way that is most likely predictable. Thus, it seems like my theory leads to innumerable, unlikely objects in the world. However, DCPSM can be strengthened by restricting the number of possible objects that one can talk about. This can be accomplished by asking whether the elements in the story have strong or weak interactions.

A strong interaction occurs when different parts of a single process affect the other parts of a process to a great degree. My nose and my mouth interact strongly in the process that is my face, not just because they are close together in space, but because to explain why one behaves in a particular way requires a description of the other. In other words, it is necessary to give at least a partial account of the nose process when discussing the mouth one because the nose process is such that it greatly affects how the simples in the mouth process interact statistically. If there were no nose there then the mouth process would be completely different: the statistical predictions we make about it would be different. Consequently, strong interaction is defined in terms of counterfactual possibilities: one can ask whether changing or negating some process would affect some other process. If the answer is yes, then they are strongly interacting. If no, then they are not.

The single object that is my nose and the atmosphere and the Eiffel Tower interact weakly. If my nose did not exist it would not affect the Eiffel Tower process. We would make almost exactly the same predictions about it as we did before. The same goes for the atmosphere: without my nose it would be nearly identical. My nose, in order to function, needs oxygen, but that has to do with the independence value that I will discuss shortly. A coherent story includes only elements that interact with each other strongly.

Some readers might think chaos theory proves that all interactions turn out to be strong interactions: the atmosphere has a strong dependence on initial conditions and so my nose might affect weather patterns in France directly, causing the Eiffel Tower to sway dramatically. To save me from chaos, these types of interactions might be labeled unpredictable types of interactions. Some given counterfactual situation in which my nose does cause the Eiffel Tower to sway is statistically unlikely. Moreover, only predictions about the actual world that can possibly be made by a rational being are allowed to count as processes. Such predictions are epistemically closed to chaos theory. Thus, they would not be statistically predictable and under my view would not count as particular processes. It is likely that they are near or actually impossible to predict: this is why chaos theory's name has "chaos" in the beginning (this is sort of a joke and not meant as a formal part of an argument). Even allowing this distinction, one might say that we currently only recognize particulars at the human scale of interaction, both in terms of rate and size. To the size claim, I would hold that this is actually not true: scientists regularly look at the universe at different scales than people are ordinarily accustomed to. To the rate of interaction objection, see the Subjectivity Problem II in the Objections section.

Another aspect of a coherent story is a value I will label *positive current independence*. Independence means the ability of a process to survive as a continuous pattern without or with little help from other processes. It does not include negative independence, such as a person's dependence on a bear not killing and eating him or her. It is current independence to designate that a process at time *now* does not depend on another process for its continued existence. For instance, I am not currently dependent upon the existence of my great-grandmother, though of course if she had not existed in the past I would not exist now.

An example of a process with a very high independence is the sun: it is an isolated thermonuclear reaction that does not require any other events outside itself to maintain this process. An example of a process with a very low independence is a heart that, if removed from a body, would cease to function completely. It cannot be a heart unless it is in the context of a body that provides it with nutrients, electrical impulses, etc. It might still be a heart if it is functioning in an artificial support system, but this doesn't change the example; it only shows that I was being too specific in designating the context that a heart can function in. What about persons? Certainly a human could not survive if cut off from a food source or the atmosphere. In that sense the person has less independence than a rock or a star.

A story about the ship is radically incomplete without including this maintenance. There is no "ship" unless you include in the story an explanation of how its parts are replaced. The ship, if considered without the system of maintenance, might be considered a particular with low independence just as a person's heart is a particular process but is highly dependent on the larger process of the body of which it is a part. So, each part of the ship is a process that has more independence than the ship that it is a part of. It is possible to describe the ship as the physical process of just the ship's wood, metal, and so on. This yields a different answer as to which ship is the Ship of Theseus. This would tell you that the ship made of the discarded parts has the same identity as the original ship, and the ship made of the replacement parts does not. A more detailed account of the role of minds is needed to account for this.

Here is the picture we have so far: the Ship of Theseus is a real process that includes a system of maintenance, and thus can survive the replacement of parts, or what we mean by the ship is the particular subprocesses of the individual parts that compose the ship and not the ship as a whole. How is this possible? Minds pick out processes in the world to focus on and tell stories about. There are different system levels that can be picked out that give different understandings of identity, and neither is privileged. Both are real, coherent ways of describing what is occurring. However, there must be some criteria for what a mind is allowed to pick out. I already said that a story about the ship as a whole that does not include the system of maintenance is incomplete and thus wrong. So, it seems if a mind is picking out something with a very low independence, it is

not picking out an appropriate object. A particular process that has continuous identity over time needs to have a high independence. Only two scales of the Ship of Theseus system give a high level of independence.

A good metaphysical theory needs to avoid a pragmatist answer, which, unfortunately, it seems I have given. If I say that there are two possible answers how the ship can be viewed, it seems I am invoking pragmatism: one can choose, depending on practical context, which ship has the identity that we have attached the rigid designator "Ship of Theseus" to. However, this is not what I have done. There is in fact only one answer to the question of which ship is the SoT: the one that includes the external system of maintenance. The reason for this is the other scale that can be used to view the ship in fact does not view the ship as a single thing. Instead, only each part of the ship is a single thing with continuous identity over time. Thus, the new ship constituted by the old parts of the ship does not have the name Ship of Theseus because nothing does: each part of the ship might have its own identity but when viewed on this scale they do not constitute a whole ship.

Does my answer to the Ship of Theseus contradict the example I gave earlier of an exemplary physical process, which I said is A moving B moving C moving D? Does my answer to the Ship of Theseus suggest that processes can be described abstractly and functionally instead of concretely and physically? Specifically, it seems like Theseus has a functional understanding of the ship cognitively, and he acts upon the design when he maintains the ship. However, this is not necessarily in conflict with a physical understanding of processes.

Take a cell in your body: it has a set of repair mechanisms built into it that replace parts, maintain damaged parts, and destroy unnecessary debris. This set of repair mechanisms is not abstract; there are specific physical conditions that cause it to act and it does specific physical things in the cell. For instance, ultraviolet light or another type of radiation can cause a molecular lesion in a strand of DNA. In fact, this happens constantly to all living creatures that use DNA, which are all the living things we know about. This lesion can disrupt the cell from transcribing the gene that the DNA encodes. To amend this problem, one of several repair actions occur that are directly chemically related to the type of damage that was incurred. Ultraviolet light results in an abnormal covalent bond, which triggers

a photoreactivation process that directly undoes the damage. In the case of the cell, the system of maintenance is clearly physical and internal to the process of the cell.

In the Ship of Theseus, one might be tempted to say that the ship's maintenance is made concrete from an abstract idea of the ship because Theseus is not as clearly part of the physical ship as the repair mechanism is in the case of the cell. However, this is just the point I have been arguing for up to this point, so I will discount this possibility. More importantly, one can say that Theseus has an idea of the ship, and it is this abstract concept that causes the ship's maintenance. My response is to say that although Theseus as a system of maintenance is different from the cell's system of maintenance, it is not fundamentally different. Theseus has neural representational states that have a conceptual picture of the ship. When a part of the ship decays to the point where it no longer allows the ship to function optimally, Theseus's representation is instantiated and he replaces a part of the ship. Thus, the action of repair can be described both physically and reductively. Theseus's representation of the ship is functional, as is DNA's representation of a cell in a sense, but it is still a process: it is a neural process of the brain representing the world.

One might argue that, due to the nature of Theseus's representations, they are maps that cannot fit the territory, are not as effective as the cellular repair mechanisms. To this, first I say that this is not necessarily the case: there are cars in stellar condition that are older than many people who are in a state of advanced decay. Second: So what? Even if you can show that some systems of maintenance are better than others you have done nothing to disprove my argument. Third: it is likely that in the SoT example the representation of the ship is distributed and not solely neural. Theseus likely has blueprints of the ship that supplement his neural recollection of the ship that are less fallible than he is. These blueprints are also part of the ship process. See Ed Hutchins¹² on distributed information and the extended mind.

I have said that a process is a statistically predictable pattern of interaction. Obviously, I am going to great lengths to avoid invoking causation, which would doom the theory. You might ask: What does this term *statistically predictable pattern* mean and why is invoking it useful? The use of probability instead of causality is motivated both by Hume and by quantum physics (see the Objections section). In

contrast to necessary causal laws governing the movement of simples and getting processes that way, my view depends upon observable and repeatable movement of simples. This movement is not necessary, as it would be if causation were assumed to be true, but instead it simply is the case that simples do behave in a probabilistic manner. It is likely when a cue stick hits a billiard ball that the ball will move in a certain way, but it is not certain. It might instead disappear and reappear on Neptune, as in fact some of the simples that were part of the ball process likely will according to quantum mechanics (and if not Neptune somewhere equally unexpected).

Is it the case that, within DCPSM, only those objects that human beings are able to predict count as particular processes? If so, then the theory is seriously counterintuitive: before we knew anything about chemistry we perceived chemical interactions. We now know that these interactions occur in statistically predictable ways; it is likely that every time one combines hydrogen peroxide with sulfite it will be oxidized into sulfate. Before we had seen this occur many times we would have been unable to draw this inference. Does this mean that this oxidative process was not real for prescientific people? Obviously, the process predated our ability to make statistically predictable propositions about it. Therefore, I can amend my theory to say that a process is statistically predictable within a Peircean¹³ ideal empirical understanding of the world. Hence, the chemical reaction was a process before we knew it.

It seems as if an alien coming to earth might organize the world conceptually in a completely different way than we. What counts for the alien as an object might not count for us, and vice versa. This does not mean that DCPSM is false. The alien will still only talk about those things that can count as objects, and those are statistically predictable patterns of interaction. The alien merely has a different hierarchy for assigning the use value of different processes, and thus identifies different ones than we. For instance, an alien might be concerned with a conversation between two people but might not count the people as things: they are parts of the conversation process. Might the alien identify objects that do not count as processes under my view? Of course: my nose plus the Eiffel Tower might have some symbolic value for the alien. This does not mean that this is an object, though: the object is the mental state of the alien that reads symbolic value in things that do not interact. This is clear even in cases of human conception. One might carve huge

letters into the earth. Assume that they have no relation to one another as defined by DCPSM. From space, though, one might see them all as part of one sentence. That sentence exists as a conceptual process but the letters by themselves do not jointly exist as an independent process.

Section 4: Objections

What I will call the Composition Problem states that there is a process $([A] \rightarrow [B])$. Processes can be subdivided. Therefore $([A] \rightarrow [B])$ can be described as subprocesses $([C] \rightarrow [D]) + ([E] \rightarrow [F])$. A process cannot have more than one essence. Therefore, processes cannot exist because they require multiple essences. My response is that a process does not have an essence, it is an essence. There is the essential process $([A] \rightarrow [B])$ and $([C] \rightarrow [D])$ and $([E] \rightarrow [F])$; they are all real. As long as a process is independent and statistically predictable, then it gets to count as a real thing.

The Subjectivity Problem I makes the following argument: I am a human being. I perceive change at a certain rate, that is, time seems to go at a certain speed. Other human beings perceive change in nearly the same way I do, with differences between people considered marginal and insubstantial. Therefore, human beings have a particular perspective on change/time. This is not the only possible perspective on change/time. Therefore, a human understanding of change/time (process) is subjectively true; it depends on a particular view of change/time, of which there are many. Subjective truth is not equal to objective truth. Therefore, human understanding of process is not objectively real. I reject this argument by throwing out the proposition that subjective truth can never achieve the level of objective truth. Instead, there is a range of possible ways of experiencing and abstracting upon that experience that does not negate the truth value of a given perspective.

Subjective Problem II asserts that any conception of a process depends upon a linear experience of time. Also, human beings experience time linearly. Experiencing time linearly is not the only way in which time can be experienced. Therefore, the existence of processes is contingent upon a subjective ontology of time. To be contingent on a subjective state is to be mind-dependent. As a result, processes are mind-dependent. A mind-dependent theory is not

realist. Thus, process essentialism is an antirealist theory. I deny that there is a possible nonlinear experience of time. One can experience one's memories in a different order from the one in which they were obtained, or take a hallucinogenic drug and have a different conception of time, but time has a direction. One always experiences this, then this, then this. The rate at which one experiences time might be different, but that one experiences time successively and forward is universal.

NOTES

1. Alfred North Whitehead, *Process and Reality: An Essay in Cosmology* (New York: Free Press, 1929).
2. Nicholas Rescher, *Process Metaphysics: An Introduction to Process Philosophy* (Albany: State University of New York Press, 1996).
3. Peter van Inwagen, *Material Beings* (Ithaca: Cornell University Press, 1990).
4. Rescher, 38.
5. Plutarch. *Theseus*. <http://classics.mit.edu/Plutarch/theseus.html>: 75 A.C.E.
6. Van Inwagen, 33. He says that a modern understanding of quantum mechanics shows that in fact there is no such thing as contact between simples. Furthermore, the fact that two things come into "contact" (if you ignore the attack from physics) cannot be all that constitutes the identity of a particular thing. Setting a drink on a table does not cause a new thing to come into being, even though they are in contact with each other.
7. It is not clear how actual particulars exemplify ideal forms. There need to be second-tier forms giving form to the first-tier ones, and third to second, and so on. This is the famous third man problem, first given by Plato himself in *Parmenides*. If one takes the view that every possible set of simples composes an object, then one gets a host of other problems: there are way too many entities in the universe, all of them are appropriate for reference, and it is not clear how this gives a solution to continuity of identity over time. Specifically, what is the relation between an object at time T1 and time T2? This theory taken by itself does not provide an answer to that question.
8. William James, *Pragmatism: A New Way for Some Old Ways of Thinking* (Cosimo Classics, 1904).
9. van Inwagen, 30.

10. One might object and say that it is not clear what stable means in this context. Is it stable relative to me or humanity as a whole or the galaxy or the history of the universe or some other perspective of scale and rate? For my answer, see the subjectivity objection I in the Objections Section.
11. James.
12. Edwin Hutchins, *Cognition in the Wild* (Cambridge: MIT Press, 1996). In this book, he specifically examines the navigation of a ship and shows that information about how to get it from one place to another is distributed throughout the entire ship. This demonstrates a case of a process, ship navigation, being spread out and not locally contained in one physical space, for instance, the brain of the navigator.
13. Charles Peirce, "How To Make Our Ideas Clear," *Popular Science Monthly* (1878).