International Journal of Undergraduate Research and Creative Activities

Volume 4
Issue 2 *Res Cogitans 2012*

Article 20

October 2023

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In philosophy of time, the view that change involves time is widely accepted and beyond doubt. Its counterpart, namely that time involves change has also been supported by many philosophers since Aristotle, but Sidney Shoemaker tried to undermine this view. In this paper I am going to set out what Shoemaker's argument is, and I will put forth reasons why it does not accomplish its goal. The point will focus in the logical impossibility to conceive the scenario that Shoemaker propounds, due to a double interpretation he does concerning temporary dependent properties, since he explicitly sets aside these properties because they probably cannot be regarded as genuine change, but I will try to show that he actually does consider them as genuine implicitly to develop his argument. The contradiction leaves us in good position to conclude that given Shoemaker's scenario, time without change remains logically impossible.

Res Cogitans (2012) 3:148-153 2155-4838 | commons.pacificu.edu/rescogitans

Time without Change: A Challenge to Sydney Shoemaker's Argument

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Published online: 07 June 2012

Abstract

In philosophy of time, the view that change involves time is widely accepted and beyond doubt. Its counterpart, namely that time involves change has also been supported by many philosophers since Aristotle, but Sidney Shoemaker tried to undermine this view. In this paper I am going to set out what Shoemaker's argument is, and I will put forth reasons why it does not accomplish its goal. The point will focus in the logical impossibility to conceive the scenario that Shoemaker propounds, due to a double interpretation he does concerning temporary dependent properties, since he explicitly sets aside these properties because they probably cannot be regarded as genuine change, but I will try to show that he actually does consider them as genuine implicitly to develop his argument. The contradiction leaves us in good position to conclude that given Shoemaker's scenario, time without change remains logically impossible.

1. Introduction

Sydney Shoemaker wrote in 1969[1] a paper defending the logical possibility of time without change. But this is only one part of the paper's goals, since apart from a metaphysical account of time he also inquires about the epistemology of time. He tries to show that even if ordinarily we are able to perceive time through the awareness of changes happening around us, it is also possible to legitimately infer, though not perceive, that an interval of time has elapsed without change. That way, he aims to give an answer to McTaggart's skeptical argument that at any given time of our experience, it might have passed a period of time without us knowing it, as long as there had not occurred any change.

I am going to start explaining the argument Shoemaker puts forth in his article, as well as the possible objections he considers that can be done, together with his answers to each of them. I will then evaluate his argument, focusing in a main problem that I will try to show he does not manage to solve, namely, the logical impossibility of the scenario he suggests due to the impossibility to explain how a global freeze could start and end without falling into a contradiction. As I consider this one as the major problem he faces, I will devote my criticism to this point, and in addition, I believe that he does give proper answers to other sort of objections considered in the article.

2. Text analysis and argument reconstruction

Let me start reconstructing the argument from the end. Shoemaker ends up the article denying the skeptical claim that we can never be justified in believing that a given amount of time has elapsed since the occurrence of a certain event, because there is no way in which we can know that the interval

between an that event and the present does not contain one or more changeless intervals (perhaps lasting billions of years).

Main Thesis

According to Shoemaker, a scenario is conceivable where time could lapse without changes, and that in such a world, people should have very good reasons for thinking that there are changeless intervals, that they should have well grounded beliefs about when in the past such intervals have occurred and when in the future they will occur again as well as their duration.

The main body of the article is focused in justifying the thesis, since it might seem logically impossible at a first sight that we can *know* time intervals without change have taken place. He points out that actually mainstream philosophers along history (including Aristotle or Hume) argued that it is impossible to conceive time without change, but Shoemaker argues that this is not right. The opposite is evidently true, i.e. that change *does* involve time, but it does not follow that no changes entails no time going by.

An epistemological approach helps us to understand why: we usually conclude that time has elapsed addressing changes as supporting evidence. Changes can be perceived either directly in our consciousness or indirectly through other objects, such as clocks. In both cases the fact that we can report some change has taken place gives us grounds to conceive time. What then, when no changes are perceived?

Thought experiment

Shoemaker suggests the following scenario. A world divided in three exhaustive regions, A, B, and C, each of them undergoing a "local freeze," a phenomenon that freezes all processes in that region, preventing any change from occurring. This period lasts for one year, and at the end of it, everything remains exactly the same as before, so that nobody living in the region can ever be aware that time has elapsed. Nevertheless, reports from inhabitants of other regions or directly observed changes in adjacent regions would eventually lead the people to believe that time has passed without changes. At this point of the example, time still involves change.

But suppose that the local freezes happen with regular intervals: every three, four, and five years for the regions A, B, and C respectively, so that at the 60th year all three regions would freeze simultaneously, and unfreeze one year later. During the freeze, no change happens, and no evidence can be reported at the end of the period; yet, the inhabitants of this world would have ground for believing that there are intervals during no changes occur anywhere.

Auxiliary premise

I call the auxiliary premise the one that Shoemaker uses to make the inference from the fact that past evidence suggests the prediction of a simultaneously freeze, to the claim the prediction involves knowledge of changeless time has occurred. As he explains, although there is not certainty to hold this belief, it is yet the most logically consistent conclusion, and by no means preferable to the hypothesis of there not being any freeze in terms of the simplicity of the former.

Possible objections and answers

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A first sort of objections could argue that during the freeze there can be change though not perception. Shoemaker does not grant this verificationist view so it is not an objection.

A second sort of objections attacks the auxiliary premise, denying the legitimacy to infer from the local periodic freezes that at the sixtieth year a global freezing will happen at all. Shoemaker's response is that though both possibilities are compatible with the evidence, it would lead to a more complex world as regular freezes would happen except for every sixty years. In addition, some modifications into the example can avoid the doubt raised to the inference.

A final objection claims that the world described in the example is logically impossible to exist, as it could not be explained neither the beginning nor the end of a global freezing period. The end in single regions' freezes could be caused by changes in the adjacent regions, but it is not applicable for a simultaneous freeze. Having discarded that the global freeze is uncaused, Shoemaker's alternative is to assume a kind of causality he calls "action at a temporal distance" and defined as follows: "X's happening at t is a necessary but not sufficient part of an actually obtaining sufficient condition for Y's happening at t; and t and t' are separated by an interval during which nothing happens that (the interval) is sufficient for Y's happening." Shoemaker makes an effort to make this kind of causality compatible with the usual principle of causality, so that the rest of the causal inferences are also justified. He adds, that even if this kind of causality could be odd in our world nothing prevent it from existing in another imaginary world as the one presented in the text.

3. Evaluation of the arguments presented in the text

Among the possible objections Shoemaker points out, there is one especially challenging, the one referred to the causality. He is aware of the difficulties and addresses the faces the problem directly in the last part of the text.

Excluding time related properties

A reservation is made from the very beginning of the article concerning what is understood by "change." Shoemaker, with good reasons, excludes time dependent properties such as "being 10 years old" or the well-known property among philosophers of "being grue," again, a property depending on time, that Nelson Goodman defined elsewhere. These are regarded as non genuine properties and so excluded from the analysis of the possibility of time without change. That is to say, time-dependent properties are not considered changes.

Shoemaker does not state explicitly the reasons for that exclusion, but we can easily observe that if we accept them, they lead us to a circular argumentation on time involving change. Since it is true that change involves time and we could report changes in objects *because* time has elapsed, we therefore conclude that as changes have been noticed, *then* time has elapsed. In other words, the fact that time has elapsed leads us to conclude the perfect tautology that time has elapsed.

Freeze intervals need a causal sufficiency

As I said, Shoemaker was right to leave these properties aside, but as soon as he finds it necessary to postulate the "action at a temporal distance" causality he is assuming that time dependent properties exist and are in fact relevant. The time lapse itself is the cause (together with other states of affairs) that

triggers the unfreeze process, so there must be something that is sensitive to time and at the end converts the time related property into a real property.

In other words, if a difference in time-dependent properties was counted as change, it would follow immediately that the idea of time without change was logically impossible. Thus, it differs from the case of a purely conceptual definition of a property involving time lapse as "grue" which does not involve any change; rather, Shoemaker implicitly accepts the case where these kinds of properties are able to produce an effect, and therefore, change.

To explain this relation between merely time dependent properties and its effect in a genuine property let me put it this way. Suppose there is an object with the genuine property P at the described universe, and that by its own nature, it has in itself the necessary conditions for exchanging the genuine property P for the genuine property Q. But this necessary conditions are not sufficient until a time elapses, that is to say, it is activated at a temporal distance. In other words, a real change is going to happen due to a time change, which means that genuine changes, and not merely conceptual changes, will occur. Therefore, if we compare the same object in two different times after undergoing the property exchange, we are supposed to see real differences in the object

Now suppose that every one year this object exchanges its properties from P to Q and vice versa, in such a way that is aligned with a six months delay with the frequencies of freezing periods. Consequently, if we saw it changing from P to Q six months prior to the beginning of the freeze, what should we expect to happen to the object as soon as the period is over one year later? So here is the *first question*: either the object with the new property P (gained at the sixth month of the freeze) or the object with the property Q (just the way it was the instant when the freeze started) will be the outcome.

An intuitive answer, given the world described, is that the object would still remain with its property Q, since the freeze period has been defined such that no change happens at all. But if time has indeed elapsed, the temporal causality chain must have been triggered, so there is a *second question*: what should we expect to happen six months later; either to change from Q to Q again (because that is what time causality establishes to the object to do: "change to Q"), or to take back again the causality "time meter" at the same point it was before, as if time did not passed, so that the object will exchange its Q property for P? If we accept the latter, it involves denying time without change so we fall into a contradiction. But if we consider the former alternative i.e. to change from Q to Q or in other words, to start another one year period being Q, it would suppose an indirect evidence that a freeze period has happened, since people would observe the object being Q for two years in a row.

Considering now the other alternative to the first question I posed, that is to say, if we expect that when freeze ends the object has got the property P instead of Q, it entails that change has happened during the freeze, which violates the principle used in the thought experiment of there being time without change. A final interpretation would include that since the causal conditions have been met at the half of the freeze period but change was not possible, we might consider that the conditions are met yet in the first moment after the unfreeze. The problem here is that inhabitants would again be aware of sudden unexpected change, from which to infer that one year time has passed.

	6 months prior	Feeze starts	Halftime of freeze	Freeze ends	6 months later	Consequence

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Alternative 1	P→**Q**	**Q**	**Q**	**Q**	Q→**P**	Time not elapsed
Alternative 2	P→**Q**	**Q**	**Q**	**Q**	Q→Q = **Q**	Freeze noticeable
Alternative 3	P→**Q**	**Q**	Q→**P**	**P**	P→**Q**	Violates pple.
Alternative 4	P→**Q**	**Q**	**Q**	Q→**P**	P→**Q**	Freeze noticeable

I hope the table above will help to clarify the four different interpretations. I believe that all of them undermine Shoemaker's intention to show how it would be justified to people in this world to believe that time has elapsed without any evidence of any sort, only by means of regularity predicted to a future case.

Yet, it can be objected to this interpretation that the alternatives 2 and 4 are consistent with Shoemaker's thesis and that the evidence, as long as they it does not show the impossibility of time without change during the freeze period. But if we are to consider that the full argument in the text includes the possibility to infer the freeze period merely by past evidence, Shoemaker.

Temporal distance causality cannot explain unfreeze
Nevertheless, I see another major problem still unsolved concerning causal sufficient reason for the unfreeze process to begin. Take the previous example of the object with two properties, but let them define now as Q: "start freeze" and P: "end freeze," while the object being "all states of affairs of the universe." How is it conceivable that when by temporal causality Q turns to P, it is the case that something else apart from the temporal change can actually change?

If we grant that freeze involves no change, then Q→P occurring within the boundaries of this period (including the very previous instant to the beginning of unfreeze) involves a violation of the principle that the no changes can occur during the freezing period, as it is expressed in the table.

For this reason I think the whole example fails to achieve its goal, i.e. to present a scenario where it is logically possible time without change *and* yet people in that world having good reasons to believe that such an interval indeed happens. The scenario to be logically possible Shoemaker introduces a special temporal causality which in turn, entails the violation of the principle of time without change.

4. Conclusion

I have sketched Shoemaker's argument not only focusing on the conceivability of time without change, but in his more extensive conclusion that if such intervals occurred we need not fall in the skeptic argument of not knowing whether right now an interval of one million years has passed. Shoemaker's claim is that we could have good reasons in a world described in his thought experiment. My conclusion is that he fails in his attempt to use this very scenario for it involves logical impossibility.

On the other hand, if we are to consider only the thesis that time without change is possible, we could formulate a much simpler scenario[2] where we assume conservations laws exist (entailing that if a certain states of affairs exist, they must exist at a later time) and the world had a single particle. From here

follows that if the particle is at rest, so that the universe has the only state of affair of "the particle x having a mass m," this very state of affairs must exist at any time in the future.

[1] Sydney Shoemaker (1969). "Time Without Change," in *Journal of Philosophy* 66 (12):363-381.

[2] I owe this point to my professor at CU Boulder, Michael Tooley.

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