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## **Time and the Domain of Consciousness**

Christoph Hoerl

### Abstract:

It is often thought that there is little that seems more obvious from experience than that time objectively passes, and that time is in this respect quite unlike space. Yet nothing in the physical picture of the world seems to correspond to the idea of such an objective passage of time. In this paper, I discuss some attempts to explain this apparent conflict between appearance and reality. I argue that existing attempts to explain it as the result of a perceptual illusion fail, and that it is in fact the nature of memory, rather than perception, that explains why we are inclined to think of time as passing. I also offer a diagnosis as to why philosophers have sometimes been tempted to think that an objective passage of time seems to figure directly in perceptual experience, even though it does not.

## Time and the Domain of Consciousness

“Nowness must either be more than an illusion or less than an illusion.” ABNER SHIMONY<sup>1</sup>

Henri Poincaré’s 1898 article ‘The measure of time’ – which anticipates the idea of the conventionality of simultaneity that was to become a key element of Einstein’s special theory of relativity – begins with the sentence: “So long as we do not go outside the domain of consciousness, the notion of time is relatively clear”.<sup>2</sup> The first three words warn of trouble ahead, for Poincaré thinks that how time seems to us in experience is in fact deeply at odds with what physics tells us. Time, it appears, is a topic that raises in a particularly stark way what Wilfrid Sellars described as the philosophical problem of reconciling the ‘manifest image’ of the world with the scientific one.<sup>3</sup>

The aim of this paper is to look at one specific aspect of this issue, which concerns the idea of the *passage of time*. It is often thought that there is little that seems more obvious from experience than that time objectively passes, and that time is in this respect quite unlike space.<sup>4 5 6 7</sup> Yet, nothing in the physical picture of the world seems to correspond to the idea of such an objective passage of time. A natural starting point in trying to reconcile these conflicting intuitions is with the idea that there are aspects of our experience of time that are not due to how time actually is, but are rather the products of features of our own psychology, though we are prone not to recognize them as such.<sup>8</sup> As I will try to show, though, fleshing out this idea is far from straightforward. In particular, my aim is to show that getting clearer about what exactly underlies the idea that time passes requires recognizing that there are two

rather different ways in which we can become aware of change over time. Contrary to what Poincaré may have thought, the ‘domain of consciousness’ is in fact a surprisingly complex territory when it comes to time.

### **The idea of passage**

The idea that time passes stands at the heart of a dispute in metaphysics between two contrasting views of time often referred to as the *A-theory* and the *B-theory*, respectively.<sup>9</sup>

Crudely speaking, the B-theorist’s view of the world is the one encapsulated in space-time diagrams of the type introduced by Hermann Minkowski, which represent the life of a physical objects such as a person as a ‘world-line’.<sup>10</sup> Whilst the B-theorist may recognize some differences between the temporal and the spatial extent of such a world-line, there is also an important sense in which she treats them in the same way, in so far as she thinks that both spatial facts and temporal facts about the person whose world-line it is can be captured exhaustively in terms of the idea of dimensions along which the person extends. In the temporal case, positions along the relevant dimension – i.e. times – form a series in virtue of being *earlier* or *later than* other such positions, i.e., what J. M. E. McTaggart called the B-series.<sup>11</sup> Hence the name B-theory.

According to the rival A-theory, by contrast, representing the life of a person as a world-line, or – in Arthur Eddington’s more polemical phrase – a ‘four-dimensional worm’,<sup>12</sup> leaves out the very thing that grounds the differences between different times. What it is for there to be a succession of different events in the life of a person in the first place, the A-theorist maintains, is for each of those events in turn to undergo a specific, *sui generis*, type of change, namely, for it to change from being

objectively *future* to being *present* and then being *past*. It is this type of change that the notion of *passage* is meant to capture.<sup>13</sup> Yet, space-time diagrams necessarily leave out the fact of passage, and therefore mis-represent reality. Or so the A-theorist thinks.

In the debate between the A-theorist and the B-theorist, the B-theorist typically concedes that we have a natural inclination to think of time as passing in the way envisaged by the A-theorist.<sup>14 15 16 17</sup> Part of the B-theorist's task is thus to explain away that inclination. In the next two sections, I will consider whether it can be explained away by arguing that it is the result of a perceptual illusion.

### **On the idea of an illusory experience of passage**

Call the hypothesis that there is no such thing as passage (contrary to what the A-theorist maintains), but that perceptual experience nevertheless presents us with an illusion of passage, the hypothesis that such experience is *metaphysically illusory* about the very existence of passage. The hypothesis, in other words, is that – presumably due to certain features of perceptual processing – there are aspects of conscious experience that make it perceptually appear to us as though time objectively passes, and as though events undergo passage in the sense envisaged by the A-theorist, even though they do not. I will argue that the hypothesis that perceptual experience is metaphysically illusory in this sense is in fact inherently unstable, at least in so far as extant attempts to give an explanatory account of such a purported illusion either presuppose that there is passage after all, or fail to make intelligible how the illusion in question can be one as of passage.<sup>18</sup>

We can find the first kind of failure exemplified in the following much-quoted passage from Hermann Weyl's book *Philosophy of Mathematics and Natural Science*:

The objective world simply is, it does not happen. Only to the gaze of my consciousness, crawling upward along the life line of my body, does a section of this world come to life as a fleeting image in space which continuously changes in time.<sup>19</sup>

Weyl's first sentence, I take it, is meant to be a statement of the B-theory, denying that time objectively passes. And what he suggests in the second sentence is that our seeming awareness of passage is in fact the result of the fact that our own consciousness itself unfolds over time, at each moment of time only ever taking in how things are at that moment.

As a number of Weyl's commentators have pointed out, however, his argument is self-undermining, if it is meant as an attempt at explaining how perceptual experience can be metaphysically illusory as regards the very existence of passage.<sup>20 21</sup> In his article 'A Defence of McTaggart's Proof of the Unreality of Time', Michael Dummett puts a related point as follows:

[To say] that time is unreal [...] seems self-refuting in something of the way in which, as McTaggart himself points out,<sup>22</sup> the view that evil is an illusion is self-refuting: that is, if there is no evil, the illusion that there is evil is certainly evil.<sup>23</sup>

What Dummett refers to as the claim that time is unreal, here, is actually more specifically what I have called the hypothesis that perceptual experience is metaphysically illusory regarding the existence of passage. Dummett makes an

analogy between this hypothesis and the hypothesis that evil is an illusion. Both hypotheses, he claims, are self-refuting, in so far as they imply the existence of the very thing they claim to be illusory.<sup>24 25</sup> Applied to the passage from Weyl quoted above, the kind of thought Dummett has in mind runs as follows. In suggesting that the gaze of consciousness ‘crawls’ along the world-line of my body, Weyl himself seems committed to the idea that, just as the A-theorist maintains, there is something that is left out by simply representing me as such a world-line, because something about that world-line itself changes over time. More specifically, the particular change in question is a matter of passage: the successive becoming present of different conscious experiences. Thus, the attempt at unmasking passage as a perceptual illusion in fact presupposes the existence of passage, at least as something that our own experiences undergo.

Clearly, Weyl’s turn of phrase is deeply metaphorical, and he might protest at this point that the facts he describes when he talks about the ‘crawling gaze of consciousness’ can be exhaustively captured in the B-theorist’s vocabulary. A response of a similar kind has been mooted by Steven Savitt,<sup>\*</sup> who writes as follows:

The insistence that time is an illusion invites the response that the elements of this illusion, the appearance of objects as in time, are presented to us successively. So does not the mere illusion of time imply that there is succession, i.e. time? This response relies on the unstated premiss that

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\* It is not clear to what extent Savitt endorses this response himself, because the position he advocates is a form of eliminativism about passage, which he distinguishes from the view that passage is an illusion. Savitt is perhaps best interpreted as advocating a B-theoretic view of the type sketched in the final section of this paper.

illusions have precisely the same sort of temporal characteristics that the [argument that time is an illusion] is designed to show they do not have.<sup>26</sup>

Like Dummett, Savitt speaks of the idea that ‘time is an illusion’ when what he actually has in mind, more strictly speaking, is once again the idea of an illusory experience as of time’s objectively passing (or ‘objectively lapsing’, as Savitt puts it elsewhere in the same article). The argument he offers on behalf of the defender of such an idea seems to run as follows: What would clearly be self-undermining is if the B-theorist, in characterizing the alleged illusory experience of passage, implicitly relied on the idea that successive stages of the experience itself undergo passage. Yet, whilst the B-theorist may agree that the alleged illusory experience of passage does indeed have successive stages, what this means can be explained without bringing in the idea of passage – it is simply a matter of different things being experienced at different points in time, as the B-theorist conceives of it.

Thus put, though, the view avoids the charge of being self-undermining only at the cost giving up on trying to provide an explanatory account of the alleged illusory experience of passage. If there is such an illusion, the mere fact that our experiences are temporally *distributed* – i.e., occur at different points in time – arguably fails to make intelligible how it arises.<sup>27</sup> Conversely, the passage from Weyl quoted at the beginning of this section is suggestive of an *explanation* of the alleged illusion only because it can be seen to assimilate it to some other, familiar, illusions, such as that of appearing to see the train on the adjacent track moving, when that train in fact stands still, and it is the train that we are on that is moving. The mechanism that makes such illusions explicable, however, is that of *mislocating change*: We experience something else as seemingly undergoing a particular kind of change, even



though it does not in fact do so, because we are undergoing a change of the relevant kind ourselves. Thus, invoking that mechanism to explain the alleged perceptual illusion as of passage in the world around us, implies postulating the existence of passage elsewhere, viz. in the occurrences that constitute our own perceptual experiences.

### **Temporal illusions and perceptual psychology**

There is in fact not just one way in which arguments used to support the hypothesis that there are experiences as of passage, but that such experiences are metaphysically illusory, can be self-undermining. Recently, a number of authors have put forward arguments in favour of this hypothesis based on empirical findings about perceptual psychology.<sup>28 29 30</sup> What I will show in this section is that they, too, end up being self-undermining, albeit in a different way from that discussed in the previous section. I will take an argument put forward by L. A. Paul as my example.

Paul's argument invokes the psychological phenomenon of apparent motion, in which two brief stationary stimuli presented successively in two separate locations give rise to an illusory impression as of one persisting stimulus moving from the first location to the second.<sup>31 32 33</sup> If the two stimuli are of different colours, the illusion will also include an impression as of a change of colour during the movement.<sup>34 35</sup> As Paul argues, the B-theorist

can use [these] experimental facts involving apparent motion, apparent change, and apparent persistence to argue that, even though all she endorses is the existence of a static universe of a series of stages, this is sufficient for the brain to produce the illusion of motion and flow involved in the experience as

of change. She can argue that, just as the series of frames of <red dot flash, left side> and <green dot flash, right side> are static inputs that create an experience as of change in color and an experience as of a persisting dot moving from the left side to the right side, the series of temporal stages in which  $O$  is  $P$  and in which  $O$  is  $Q$  are static inputs that create an experience as of change from  $O$  being  $P$  at  $t_1$  to  $O$  being  $Q$  at  $t_2$ . [...] In this way the [B-theorist] shows how the brain could interpret the information it receives in order to realize experiences as of flow or animation, that is, as of change and, by extension, as of passage.<sup>36</sup>

Note that Paul's argument turns on a contrast between what she calls 'static inputs' and 'experiences as of motion and flow', respectively. In short, her argument seems to be that, since apparent motion shows that static inputs can give rise to experiences as of motion and flow, the B-theorist can appeal to apparent motion to show how the existence of such experiences in general is compatible with the idea of a 'static universe of stages'.

Thus understood, though, the argument turns on an equivocation over the word 'static'. When Paul talks of a 'static universe of stages', what she has in mind is the B-theorist's metaphysical claim that the universe consists of a series of temporal stages, qualitative differences between which amount to the universe changing over time, but which, as the individual stages they are, are static in the sense that do not themselves undergo the further type of change the A-theorist refers to as passage. Call this the *metaphysical reading* of 'static'. Quite a different, *empirical reading* of 'static' is at issue in calling the inputs generating the phenomenon of apparent motion static. They are static in the sense that each of them lasts for a brief period of time, over

which it does not change its position or colour, even though the display as a whole generates the experience as of something continuously moving and changing over time.

Another way of putting the point here is that on the metaphysical reading of ‘static’, for things not to be static would be for the world to be as the A-theorists takes it to be. On the empirical reading of ‘static’, by contrast, something can fail to be static without this making the A-theory true. If what was displayed on the screen was a stimulus that was actually moving and changing colour, for instance, the stimulus would not be static in the way the actually displayed stimuli are, but in a sense that can still be described in B-theoretical terms – by saying that there was one stimulus that occupied different locations and had different colours at different times.

The upshot of this is that Paul’s argument, too, is self-undermining, but in a different way from that discussed in the previous section. All that phenomena like apparent motion can show, it seems, is that we can sometimes misperceive facts that fit one B-theoretical description for facts that fit another B-theoretical description. So rather than making intelligible how there can be illusory experiences as of passage, even though there is no such thing as passage, Paul’s argument should actually lead us to ask whether certain aspects of perceptual experience that we are prone to describing in passage-implying terminology are not in fact thus mis-described, because they actually present us with a world that is just as the B-theory has it.<sup>37 38 39</sup>

### **Varieties of temporal awareness**

It appears that, *if* there are perceptual experiences as of passage, they must be veridical at least to the extent that they show passage to exist, since attempts to unmask them as metaphysically illusory seem to end up being self-undermining in

either one or the other way sketched in the previous two sections. If this is right, the only choice this leaves the B-theorist is to deny that there are such perceptual experiences in the first place – we neither perceive things undergoing passage, nor does it even perceptually appear to us that they do so. At first, the very idea of such a brute disagreement over the phenomenology of our own experiences may appear baffling (unless we think of the B-theorist as suffering from a form of blindness). I think it can be made sense of, though, once we recognize that we can be aware of how things unfold over time not just directly, through perceptual experience, but also through the interplay of perceptual experience and memory – for instance, when we become aware that something has changed because it no longer is the way we remember it as being, even though we did not perceive it changing.<sup>40 41</sup> Indeed, I want to suggest that the difference between these two ways in which we can become aware of change over time is important in two ways. First, in so far as there are aspects of our awareness of time that might be said to correspond to features of the idea of passage, this is because of the nature of memory, rather than because of that of perceptual experience. And, secondly, in so far as we are nevertheless tempted to think that passage is also a feature apparently presented to us in perceptual experience, this is because we mistake the difference between those two modes of becoming aware of change over time for a difference in what they (apparently) make us aware of.

There is an important asymmetry in our epistemic access towards the past and the future, in so far as we can remember the past, but not the future. I will assume that this asymmetry can be given an explanation compatible with the B-theory, although there is no scope here for discussing how exactly it is to be explained.<sup>42</sup> Rather, my main focus will be on its consequences. Eric Olson considers what consequences an

analogous asymmetry in space would have for our experience:

If it were a law of nature that light never travelled southwards, everything to the south of you would appear bright during daylight hours, while to the north you would see only darkness. Your latitude would appear unique: it would seem to be the boundary between the illuminated part of the earth and the dark part. If you moved north, the darkness would seem to recede, so that more of the earth became bright. The boundary would appear to move, as if the dawn were following you. But this would all be an illusion. In reality there would be no boundary between the bright latitudes and the dark ones. They would all be equally bright. Nor would the overall pattern of illumination change as you moved. It is the same with the present.<sup>43</sup>

Olson's analogy captures well, I think, what might stand behind our tendency to oscillate between what Huw Price calls an 'exclusive' and an 'inclusive' picture of the present.<sup>44</sup> On the one hand, we are tempted to think that being present elevates one moment to a unique status amongst all others – that, in the present, we stand on an objective cusp between two quite different regions within time. Yet, on the other hand, we also think that, at each moment in time, that moment is present, contradicting the idea of uniqueness.

What Olson's analogy brings out is that we can resolve this contradiction by realizing that, at each moment, there is indeed *for us* a difference between the past and the future, but that this difference is simply generated by the asymmetric epistemic access we have to the past versus the future.

Clearly, the A-theorist will insist at this point that time, at least as it appears to us, possesses an inherent *dynamism* for which there is no analogue in Olson's spatial example. As Olson himself says, in the spatial case he envisages, we are free to move around, and would thus soon realize that what seems to us an objective boundary is in fact an artifact of our own perspective. Yet, in the case of time, there is no such freedom to move around, nor indeed does there seem to be an equivalent to the idea of stopping. It seems time itself forces upon us a constant change in perspective as it relentlessly marches on, and that is something as yet unaccounted for by the B-theorist.

As this way of putting the point makes clear, though, the real issue behind the idea that there is a dynamic aspect to our experience that still needs to be accounted for is the sense in which we seem to be *passive* with respect to the temporal order of our experiences. And it seems that this, too, might be something we can explain in terms of the epistemic asymmetry already noted. Illustrating the point, Natalja Deng, for instance, asks us to

consider John Doe's experience at dinner time on November 18th, 2010. Not only does that time matter especially to John then, but he remembers feeling the same at earlier times. For example, he remembers sitting at his desk at 3 o'clock that afternoon and spilling coffee. He also remembers that, at that time, he had future-tensed beliefs about dinner but no memories about any times later than 3 o'clock. So John at dinner time notices that time has 'moved on'. [N]ot only does he feel as if he is constantly 'moving towards' the future, but he feels a certain *passivity* in this respect.<sup>45</sup>

What Deng points out here is that there is an apparent order to our experiences, in so far as they are accompanied by memories of other experiences. Each experience presents itself as the culmination of a series of experiences, which seems ordered by the following relation: For each other experience  $x$  in the series, there is another experience  $y$  that is different from  $x$  in that  $y$  is accompanied by a memory of  $x$ , but not vice versa. This is again due to the epistemic asymmetry noted earlier, that we can remember the past, but not the future.

Like the feature pointed out by Olson, this is a feature every experience has, in virtue of being accompanied by memories of other experiences, but that, at the same time, seems to give every experience a special status. Not only do we have the impression, at every moment, of being on an objective cusp between two quite different regions of time, we also have the impression that all other such moments we know of have led up to it, i.e. that the cusp between the past and the future is objectively moving in the future direction.

In short, then, my suggestion, in line with other writers, is that it is in fact the nature of memory that explains why we have an impression of time's passing.<sup>46 47 48</sup> Yet, to this the A-theorist is likely to make a final objection. The defender of the idea of passage is likely to protest at this stage that there is more subjective immediacy to our experience of passage than has been accounted for so far. As C. D. Broad says,

it is a notorious fact that we do not merely notice that something *has* moved or otherwise changed; we also often see something *moving* or *changing*. This happens if we look at the second-hand of a watch or look at a flickering flame. These are experiences of a quite unique kind. [...] It is [...] clear that to see a

second-hand *moving* is a quite different thing from “seeing” that an hour-hand *has* moved.<sup>49</sup>

What the A-theorist is likely to maintain is that we think of time as passing not just because of the interplay between experience and memory, but that we seem to see time passing right before our eyes, so to speak, for instance when we simply see the second-hand of a watch move, as described by Broad.

This is, of course, nothing other than the brute dispute about phenomenology that I described earlier when I said that the B-theorist should simply reject the idea that it perceptually appears to us as though things are undergoing passage. Yet it is in fact Broad’s own observation that also provides the B-theorist with materials for a more substantive response at this stage. For she can use it to argue that the A-theorist’s idea that we can perceive the passage of time is grounded on a genuine insight into an aspect of the phenomenology of temporal awareness, but gets it wrong about what that aspect is. As Broad observes, sometimes, when we look at an object that is in fact moving, all we have are experiences of the object occupying different locations at different times, without us ever actually seeing the object moving. In cases of this sort, we can become aware of the movement only through the involvement of memory: by remembering it having been at a different position from the one it occupies now. On other occasions, though, when the movement is fast enough, we can simply see the object move. The A-theorist’s mistake, the B-theorist will maintain, is to conclude from this that experiences in which we do see an object moving must involve something else being (apparently) presented in experience – i.e. passage – in addition to the object occupying different locations at different times. Yet, this is to mistake the difference between two different modes through which we



can become aware of the movement of an object – i.e. through the involvement of memory as well as through direct perceptual experience – for a difference in what it is we become aware of. It is ultimately once again a feature of the nature of memory – i.e., that it provides us with a way of becoming aware of things changing over time that is distinct from the ability to perceive them doing so – that tricks us here.

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