

## The Time of Our Lives

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Early last century an article appeared which transformed the philosophy of time. The article was James Ellis McTaggart's 'The unreality of time', published in 1908.<sup>1</sup> As his title implies, McTaggart argued in this article that there is in reality no such thing as time. But that claim, although startling enough, is not what makes the article so remarkable. The same claim had after all been made long before McTaggart, for example by Kant in 1781,<sup>2</sup> and in McTaggart's sense it is still made by those who think that time is merely one of the four dimensions of an unchanging 'block universe'. However, most of those who think this are more influenced by Minkowski's comment, also made in 1908,<sup>3</sup> that relativity has doomed space and time to 'fade away into mere shadows' of a unified spacetime than they are by McTaggart's more substantial arguments.

Actually, what is even more significant than McTaggart's arguments is his way of stating them. For here as elsewhere, the key to answering a hard question is seeing how to put it, which for McTaggart meant drawing his now-standard distinction between two ways of saying when things happen. One way is to say whether they are past, present or future and, if not present, then how past (yesterday, last week, ten years ago) or how future (tomorrow, next week, ten years hence). Events ordered in this way, by their temporal relations to the present, form what McTaggart called the 'A-series'. His other way of ordering events, into what he called the 'B-series', is by how much earlier or later they are, not than the present but than each other. And McTaggart's first great contribution to the philosophy of time was to show how many important questions about time are really questions about his two series.

To see why this is so, we must start by comparing time with space, whose dimensions are obviously more like time than is any other way of ordering things, e.g. by their temperatures. The reason is that time and space form a four-dimensional array of possibilities – namely spacetime points – each of which enables two things to coincide or be in contact, i.e. to be able to interact immediately, at that point. So to say that there are four dimensions of space-

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<sup>1</sup> J. M. E. McTaggart, 'The Unreality of Time', *Mind* **18** (1908), 457–484.

<sup>2</sup> Immanuel Kant (1781), *Critique of Pure Reason*, transl. N. Kemp Smith, (London: Macmillan, 1933), 76.

<sup>3</sup> H. Minkowski (1908), 'Space and Time', transl. W. Perrett and G. B. Jeffrey, *The Principle of Relativity*, A. Einstein *et al.* (London: Methuen, 1923), 75.

time is just to say that there are four ways in which things can *fail* to coincide, by having different locations in at least one of these dimensions. In other words, what distinguishes time and space from everything else is the fact that people and things can – literally – contact each other by, and only by, being in the same place at the same time. Whether they share the same temperature, colour, shape or any other property is irrelevant to whether or not they are in contact and thereby able to interact immediately. So the first, easiest and largest part of the answer to the question ‘What is time?’, which tells us how it differs from everything else except space – and is, incidentally, quite independent of the special theory of relativity – is that it is one of the four dimensions of spacetime.

That of course still leaves the question of how time differs from the other dimensions of spacetime, a question which nothing in the theories of relativity either answers or makes redundant. McTaggart’s answer is that time is the dimension of *change*. And so of course it is: change is something’s having incompatible properties at different times. To move, i.e. to change one’s place, is to be first at one place and then at another; to change colour is to have first one colour and then another; and similarly for size, shape, temperature and all other changeable properties. A change is a variation over time in the properties of some thing.

But why should this fact distinguish time from space? After all many properties also vary across space. Take that venerable philosophical weapon, the poker, and imagine one stuck in a fire, thus making it hot at one end and cold at the other. Why should we not call this spatial variation of temperature a change? It is not enough to reply that what we *mean* by change is variation over time rather than across space. That just prompts the question of why we draw this distinction between temporal and spatial variation. And how, if we do draw it, are we then to distinguish time from space? We cannot do it by defining time as the dimension of change if we then define change as variation over time but not across space.

Or can we? McTaggart thinks we can, because he thinks there must be more to change than having incompatible properties at different times. Suppose your central heating comes on at 6 o’clock and warms your house by 7 o’clock. What, McTaggart would ask, makes this rise in temperature a change? Not just the facts that your house is cold at 6 and warm at 7, for those facts never change. If your house is cold at 6, it cannot later on *not* have been cold then; nor, if it was warm at 7, can it ever not have been *warm* then. If these are ever facts, they are always facts. But how can two such unchanging facts constitute a change?

According to McTaggart, they cannot. Changes are not facts about how cold or warm your house is at 6 or at 7 but about how cold or warm it is *now*. So at 6, i.e. when it is *now* 6,

the relevant fact is that your house is *cold now*; and at 7, i.e. when it is *now* 7, the relevant fact is that your house is *warm now*. Those are the changeable facts. The fact that your house is cold now is *not* always a fact, since it is a fact at 6 but not at 7; just as the fact that your house is warm now is a fact at 7 but not at 6. Those are the facts whose comings and goings make the warming up of your house a case of change.

Thus, for McTaggart, what makes temporal variation change is that it entails changing facts about how things are *now*. And what makes these facts change is that the present *time* keeps changing. What makes your house first cold now and then warm now, given that it is cold at 6 and warm at 7, is that first it is now 6 and then it is now 7. When it is now 6, everything whose time is 7 is one hour into the future, meaning that it will be present in an hour's time; and when, an hour later, it is now 7, everything whose time is 6 is one hour into the past, meaning that it was present one hour ago. In short, what makes change possible is the so-called *flow* or passage of time, and hence of everything in it, from the future *via* the present to the past. So what makes time differ from space, by making it the one and only dimension of change, is the fact that time flows and the dimensions of space do not.

And here, for McTaggart, lies the rub, since he argues also that time *cannot* flow, so that in reality there can be no change, and hence, for him, no time. He admits of course that there is a fourth dimension of what we call spacetime, a dimension which we mistake for time. But as he thinks variation in this dimension no more entails change in his sense than spatial variation does, he declines to call it time. That is what he means by saying that time is unreal.

Put like this, McTaggart's claim may be more credible; and indeed, as I have said, it is in substance still widely accepted, albeit differently expressed and held less for his reasons than as a false inference from relativity. But even if McTaggart's own objection to the flow of time is still disputed, no one disputes his distinction between the A- and the B-series, which is what his objection rests on. And it is that distinction, and what it can tell us about how we should think, not only about time but also about ourselves, that has made McTaggart's work on time so prescient and so fruitful.

To see why, consider the personal analogue of the *present*, namely one's own *self*. We can relate people to each other in two ways, analogous to McTaggart's two ways of relating events in time. In what I shall call the *personal* way, analogous to McTaggart's A-series, we relate people to ourselves. The relations may be familial, like being a parent, a cousin, an in-law, etc.; or they may be spatial, as in being a neighbour; or social or political, as in being an employee or a leader of a political party; or indeed of any other kind. What matters here is

not what the relation is but whether it is directly or indirectly to *us*: as in *my* parents, *my* neighbours, *my* cousin's employees, *my* nephew's flatmate's party leader, and so on.

This is what I mean by the personal way of identifying and describing people, namely by relating them directly or indirectly to ourselves. The other, *impersonal* way, analogous to McTaggart's B-series, is to relate people not to ourselves but to each other, as in Jill's parents, John's neighbours, David's cousin's employees, Fred's flatmate's party leader, and so on

Now let us ask how these two ways of relating people differ, first in reality and then as ways of thinking about reality. In reality, the personal way is obviously parasitic on the impersonal way. For the latter is simply defined by who is related in what way to whom, regardless of which of the people concerned, if any, is me; and these impersonal relations between people then fix all the personal ones. Thus if John is Hugh's cousin and I am Hugh, John must be my cousin; and similarly in all other cases. So personal and impersonal reality can only differ if there is in reality more to John's being *my* cousin than there is to his being Hugh's cousin; which in turn will be the case only if *my* being Hugh is itself a substantial part or aspect of reality.

Now you may think it obvious that it is. But it cannot be, as the following analogue of McTaggart's argument against the flow of time shows. In asserting this I am not of course denying that when I say 'I am Hugh', that statement is true, or that when my cousin says 'I am John', that statement is also true. The question is what *makes* these statements true. It cannot be the fact that in reality I am Hugh and not John, since that would make John's statement false. Nor can it be that in reality I am John and not Hugh, since that would make Hugh's statement false. And nor can I be both Hugh and John, since at most one person can be me. The fact is therefore that taking personal truths like 'I am Hugh' to be made true by corresponding personal facts only generates contradictions, by requiring the fact that I am Hugh both to exist, in order to make Hugh's statement 'I am Hugh' true, and also not to exist, to enable John's statement 'I am John' also to be true.

What then does make these personal statements true? The answer is simple. For example, for any X, statements of the forms 'I am X', 'X is my cousin' and 'I live in X' are made true respectively by being said by X, by a cousin of X and by someone who lives in X. But those are all impersonal facts about who says what, lives where and is related in a certain way to whom, regardless of which if any of those people is me – which is why these facts imply no contradiction. And that is why, if we are to say without contradiction what in reality makes

personal statements true, we must take reality itself to be impersonal, i.e. to contain no such facts as *my* being Hugh, or *my* being John's cousin or *my* living in Cambridge, over and above Hugh's being and doing those things.

The simplicity and obvious soundness of this argument against a personal reality makes it remarkable how few philosophers accept its equally sound and simple temporal analogue, namely McTaggart's argument against the flow of time. Here again we need not deny that when, at 6 o'clock, I say 'It is now 6', that statement is true, and when at 7 o'clock I say 'It is now 7', that statement is also true. But again the question is what *makes* these statements true. It cannot be the fact that in reality it is now 6, or that would make my 7 o'clock statement false. Nor can it be that in reality it is now 7, or that would make my 6 o'clock statement false. And nor can it now be both 6 and 7, since at most one time can be now. The fact is therefore that taking A-series truths like 'It is now 6' to be made true by corresponding A-series facts only generates contradictions, by requiring the fact that it is now 6 o'clock both to exist, in order to make my 6 o'clock statement 'It is now 6' true, and also not to exist, to enable my 7 o'clock statement 'It is now 7' also to be true.

What then does make A-series statements true? Again the answer is simple. For example, for any X, statements of the forms 'It is now X', 'X was last week' and 'X is due tomorrow' are made true respectively by being said at X, in the week after X, and the day before X is due. But those are all B-series facts, about when things happen and are said, regardless of which if any of those things and sayings are present – which is why these B-series facts imply no contradiction. And that is why, if we are to say without contradiction what in reality makes A-series statements true, we must take reality itself to contain no A-series facts, i.e. no such facts as X's being now, or a week before now, or due a day after now.

Sound and simple though this argument is, to call it contentious would be an understatement. But I have no space here to defend it against its many perverse but ingenious critics.<sup>4</sup> Instead I shall try to make it more palatable by showing why, even in a purely B-series world, we are bound to think about that world in A-series terms, i.e. in terms of past, present and future. And here again it will help to bring in the personal analogue. For as Thomas Nagel wrote in 1986, 'if it is not a fact about the ... world that I am [Thomas Nagel], then something must be said about what else it is, for it seems not only true but ... one of the

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<sup>4</sup> See L. Nathan Oaklander and Quentin Smith (eds), *The New Theory of Time* (New Haven: Yale University Press, 1994).

most fundamental things we can say about the world'.<sup>5</sup> Similarly, if less self-centredly, I say that if it is not a fact about the world that such-and-such events are happening now, then something must be said about what else it is, for this too seems not only true but a most important thing to say and believe.

To see what we should say about this, consider first how what we want, and what we believe, affects how we act. The connection, as quantified in modern decision theory, is roughly that, as Frank Ramsey put it in 1926, 'we act in the way we think most likely to realise the objects of our desires',<sup>6</sup> a thesis that is now a stock if contentious ingredient of so-called functionalist theories of belief and desire. However, for present purposes, all I need is the simpler and less contentious qualitative claim that, usually, we do what we think will get us what we want, a claim that I hope no one will deny.

That for example was what caused me to go to London on 22 October 1999 in order to give the lecture at the Royal Institute of Philosophy of which this (with minimal and obvious variations) is the text. I went there then because I wanted to give that lecture, which I believed I was due to give there on that day. But for that belief to cause this action of mine it had, as John Perry, using other examples, showed in 1979,<sup>7</sup> to be both a personal and an A-series belief. Believing that Hugh Mellor was due to speak in London on 22 October would not have been enough. That belief did not after all make anyone else go to London to speak, simply because no one else believed 'I am Hugh Mellor'. Nor would that belief have made *me* go to London then if I had forgotten who I was, and thereby ceased to believe that the speaker was not only Hugh Mellor but *me*. And similarly with the date. Wanting to be at the lecture, and believing it to be on 22 October, would not have taken anyone there on 22 October unless and until they also acquired the A-series belief 'Today is 22 October'.

It is obvious therefore *that* we need personal and A-series beliefs to make us act when we do. What is less obvious is *why* we need these beliefs, a question whose answer lies in an underrated fact about truth: namely, that truth is the property of our beliefs which enables us to get what we want. Consider again my going to London to give this lecture on 22 October because I believed I was due to do so then. That belief would have made me go to London

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<sup>5</sup> Thomas Nagel, *The View from Nowhere* (Oxford: Oxford University Press, 1986), 57.

<sup>6</sup> F. P. Ramsey (1926), 'Truth and Probability', *Philosophical Papers* (Cambridge: Cambridge University Press, 1990), 52–109, 69.

<sup>7</sup> John Perry, 'The Problem of the Essential Indexical', *Noûs* 13 (1979), 3–21.

even had it been false, i.e. even if I had made a mistake and was not in fact due to speak on that date. And as in this case, so in general: the truth or falsity of our beliefs does not in general affect what they make us do. What it does affect is whether what they make us do will *succeed*, i.e. get us what we want to get by doing it. It is only because the belief that took me to London on 22 October was true then that my going there succeeded in ‘realising the object of my desire’, namely to give this lecture. Had my belief been false, i.e. had I not been due to lecture then, the action (going to London) which my belief caused me to do would have failed to achieve the object for which I did it.

This link, between the truth of our beliefs and the success of our actions, is the grain of truth in so-called pragmatic theories of truth, such as that published by William James in 1909.<sup>8</sup> I think in fact that, as Jamie Whyte has argued,<sup>9</sup> this link enables us to define truth, although that again is not a case I need to make here. All I need here is the undeniable fact that actions do generally depend for their success on the truth of the beliefs that cause them. For that fact is enough to explain why we, like all agents, need personal and A-series beliefs even in a wholly impersonal and B-series world.

This explanation, of our need for personal and A-series beliefs, starts with the obvious fact that almost all actions depend for their success on who does them and when. Thus for my action in going to London to give my lecture to succeed, it had to be done by the person who was due to give the lecture, namely Hugh Mellor, and on the day set for the lecture, namely 22 October. So far, so obvious. But to see what this obvious fact implies about the beliefs that cause our actions we need another obvious fact, namely that I will only be caused to act by beliefs that *I* have, and then only *when* I have them. No one else’s belief that I was due to speak would have taken *me* to London: the person who needed to believe that was me. And for even that belief of mine to make me go to London on 22 October, I had to have it not on the day before, or the day after, but on that very day.

All this follows from the fact that, for reasons I need not go into, causes never act immediately at a distance in either space or time. Our actions are therefore bound to occur roughly when and where the beliefs and desires which cause them occur, namely where we are when we have those beliefs and desires. I say ‘roughly’ because our beliefs and desires do not in fact cause our actions immediately, but only via such effects as contracting our

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<sup>8</sup> William James, *The Meaning of Truth* (Cambridge, Mass.: Harvard University Press, 1909).

muscles, moving our limbs, or generating the sound, light or even radio waves by which we act on people and things at a distance.<sup>10</sup>

Now combine all this with the fact that our actions usually succeed only if the beliefs that cause them are true. It follows then that, for an action's success to depend on who does it and when, it must be caused by a belief whose truth also depends, in the same way, on who has that belief and when. That is why, in order to make me go to London to lecture when I did, I had to believe at the time that the lecturer was *me* and the date of the lecture was *today*. For since my action in going to London would succeed only if done on the due day and by the advertised speaker, the belief that caused it had to be true only if it was held by that person on that day. But the only beliefs which respectively fit those two bills are the A-series belief that today is the due day, and the personal belief that the speaker is me.

This is why we, as agents, need personal and A-series beliefs. We need them to enable us to act *when* we need to act, and when *we* need to act, in order to make our actions succeed. And not only in such minor matters as the giving and hearing of lectures on time, but in matters of life and death. No species could survive whose members' reactions to food, predators and prospective mates were not right, timely and made by themselves. So the members of any species whose actions are, like ours, caused by their beliefs and desires, must have personal and A-series beliefs – and must generally acquire them only when they are true.

This therefore is the original and basic function of our senses: to make the appearance and disappearance of food, predators and prospective mates cause us respectively to believe and to disbelieve '*I am now facing food/a predator/a prospective mate*' when and only when those beliefs and disbeliefs are true. And as in these situations, so in all others where we need or want to act. Only personal and A-series beliefs that are reliably formed (i.e. formed only in whom and when they have a high chance of being true) will enable us generally to act when we need to act in order to act successfully. This is why I call the present-centred A-series

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<sup>9</sup> J. T. Whyte, 'Success Semantics', *Analysis* **50** (1990), 149–157.

<sup>10</sup> For present purposes we can neglect all such distances and delays. For first, they may be negligible, as they are for so-called 'basic actions' like moving our limbs (see Arthur Danto, 'Basic Actions', *American Philosophical Quarterly* **2** (1965), 141–148). And second, even when they are not negligible, they mostly only affect when an action ends, not when it starts. Thus my action, going to London, *started* almost as soon as I acquired the belief that it was time to leave Cambridge. That belief is what caused my action, i.e. caused it to start, then and there, even though the action ended sixty miles away and ninety minutes later. So even in this case it is true enough to say that our actions are caused by the beliefs and desires we have when we do them, meaning when we start to do them.

conception of time, this practically indispensable way of thinking of events as being past, present or future, ‘the time of our lives’: for we literally could not live without it.

And yet, I say, this is not in reality how time is, since there is in reality no distinction between past, present and future, and hence no flow of time and no changing A-series facts. But then what in reality does distinguish time from space? The answer, proposed by A. A. Robb in 1914 and elaborated by Reichenbach in 1928,<sup>11</sup> is *causation*: time is the *causal* dimension of spacetime. This answer exploits the fact that while causes have effects in all spatial directions, as when a fire gives off heat all round, they have them in only one temporal direction, since causes only ever precede their effects. That is why nothing we do ever affects anything that happens before we do it, and also why we never see anything before it happens, since to perceive something is always, among other things, to be affected by it.

There are admittedly objections to this causal theory of time, based on apparent or allegedly possible cases of simultaneous or backward causation. Of these all I can say here is that all such objections can be met.<sup>12</sup> And to this claim I would add that I know of no serious alternative to a causal theory of how time differs from space. In particular, none of the other ways of defining time and its direction that have been touted – for example, as the dimension and direction in which entropy increases, or the universe expands, or radiation travels away from small sources – explains why we never affect the past or perceive the future.

This however does not tell us why we should call the causal dimension of spacetime the dimension of *change*, i.e. why variation along spacetime’s non-causal and therefore spatial dimensions should not also count as change. To see why it might not, we must first ask what distinguishes change from mere difference. Why is *my* house being cold and *your* house warm merely a difference, while mine being cold at 6 and warm at 7 is a change? The answer is of course that we only call a difference in properties a change if there is a single thing – the thing that changes – which has the different and incompatible properties.

Yet how can a single thing have incompatible properties? In the spatial case, of a poker simultaneously hot at one end and cold at the other, the answer is that it does not: the poker as a whole is neither all hot nor all cold; and the part of it that *is* hot is not the same as the part of it that is cold. That is why spatial variation in the properties of a single thing is not a

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<sup>11</sup> A. A. Robb, *A Theory of Time and Space* (Cambridge: Cambridge University Press, 1914); Hans Reichenbach (1928), *The Philosophy of Space and Time*, transl. Maria Reichenbach and John Freund, (New York: Dover, 1957).

change, but merely a difference, since what has the different properties in these cases is not the thing itself but merely different parts of it.

Why should we treat temporal variation differently? We certainly do treat it differently, precisely because we do not normally think of people and things as having temporal parts. The audience at my lecture may not have thought I was all there mentally, but they certainly thought I was all there temporally: they thought it was me, and not just a part of me, that they were seeing and hearing. And the same goes for the building in which I gave the lecture. That is why everyone – or at least everyone untainted by philosophy – would take any temporal variation in someone's properties, or those of a building, to be a change and not just a difference: because in each case they think there is a single entity whose varying properties are all properties of *it* and not just of different parts of it.

However, many B-series philosophers, such as David Armstrong,<sup>13</sup> say that we are wrong to think like this, and argue that in reality people and things *do* have temporal parts. But although I disagree with them, I shall not rebut their arguments here. For even if we do have temporal parts, our normally failing to think and talk as if we do still explains why it is only temporal variation that we *call* change. So the real question is not why we do that, but why we only apply the concept of change to variation along the *causal* dimension of spacetime.

The answer to this question lies in the fact that we take the identity of things to depend on their keeping some at least of their properties. For example, some of my properties, such as being human, may be essential to me, i.e. such that I could not lose them, because nothing that lacked them would be me. But even if no one property is in this sense essential to me, so that I might conceivably change by sufficiently gradual stages into a beetle or a rhinoceros, no one thinks that I could survive the simultaneous loss of *all* my properties. And this means that, while any one changeable property of mine *is* changing, I must, in order to preserve my identity through that change, keep enough of my other properties *unchanged*.

But what keeps most of my properties unchanged over time is the same as what makes some of them change, namely causation. My present height, weight, views of time and other fairly constant properties of mine are what they are now because – literally *because* – since nothing has happened to change them, that is what they were a minute ago. The causation of

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<sup>12</sup> See my *Real Time II* (London: Routledge, 1998), chs 10–12.

<sup>13</sup> David Armstrong, 'Identity Through Time', *Time and Cause: Essays Presented to Richard Taylor*, Peter Van Inwagen (ed.) (Dordrecht: Reidel, 1980), 67–80.

stasis may be less obvious than the causation of change; but it is no less real, and no less necessary to secure the identity that is needed to make a difference a change.

This is why a merely spatial variation in a thing's properties, for example from the hot to the cold end of a poker, is never a change. Because causes are never simultaneous with their effects, no poker can have any property at one end just because it has the same property at the other end at the same time. That is what stops a poker's two ends being a single thing in two places at once – as opposed to two parts of a single thing – and thereby makes any difference of properties between them merely a difference, and not a change in the poker as a whole.

This explanation of why we limit change to the causal dimension of spacetime is fairly new, and not yet as widely held as it should be. Still, what matters here is that no one doubts the fact which it purports to explain, namely that, rightly or wrongly, we apply the concept of change to, and only to, temporal variation. For given this fact, there are undeniable changes in us which explain why we feel that time flows despite the fact that in reality it does not. These changes are those we need to keep making in our A-series beliefs in order to keep them true, as we have seen that they must be if our actions are to get us what we want. That is why, for example, when I woke up on the morning of 22 October, my previous belief that my lecture was *tomorrow*, which had been true the day before but was now false, turned into the belief that my lecture was *today*, a belief that was false the day before but was now true. And as these two beliefs are clearly incompatible properties of a single thing (me), my having one of them on 21 October and the other one the next morning was a real change in me, a change with real causes, such as my hearing the date on the radio that morning, and real effects, such as my going to London on that day.

Again, as in this case, so in general. Our beliefs about what is past, present and future are changing all the time: your beliefs about what you are reading right now, for example, are changing every second. These, and all the other changes we are continually making in our A-series beliefs, are real changes, with real causes and real mental and physical effects. They are the changes that embody our experience of the flow of time. Even though time does not flow in reality, in our minds the time of our lives really does flow, a fact whose recognition will I hope make the B-series view of time itself more credible.

Note however two things that what I have just said does *not* imply. First, it makes no concession to the A-series view of time itself. In particular, it does not mean that the flow of time is a real but so-called 'mind-dependent' phenomenon, i.e. that time really does flow in our world, but only because our world contains minds which somehow make it flow. That is

not so: there is no possible world, with or without minds, in which time flows. So in particular, whatever else may make psychology irreducible to physics, it is not the flow of time, which psychology no more needs to postulate than physics does.

Nor, on the other hand, have I implied that the A-series beliefs whose continual changes are what make us experience time as flowing are false. Mine is not a so-called ‘error theory’ of A-beliefs, such as my belief, held on 22 October, that that was today’s date. That belief, held then, was as absolutely true as the belief that the earth is round. There need be no error at all in any of our A-beliefs, about whether an event is past, present or future, provided we have them all at the right times. Consequently, our experience of time flowing can be not only real but true, as when I came to believe, on the morning of 22 October, that my lecture was today. In that sense the flow of time is no more illusory than, for example, what we call mirror images are. For just as it is not my beliefs about what I see in a mirror that are false, only the theory that what makes them true is an array of visible but intangible objects behind the mirror, so it is not our A-beliefs about what is past, present and future that are false, only the A-theory of what makes them true.

Where, finally, do we get the ever-changing A-beliefs that constitute the time of our lives? Just as our theory of mirrors must explain how a world without mirror images can give us true beliefs about what we see in mirrors, so a B-theory of time must explain how a world without A-facts can give us true A-beliefs. How can my hearing a clock strike 6 tell me truly that it is now 6 o’clock if in reality there is no such fact as its now being 6 o’clock?

The answer to that rhetorical question is that we are born with the default habit of letting our senses make us believe that what they show us is happening *now*. Where does this habit come from? The answer must I think lie in evolution. What makes it generally useful to see events as being present is that the light which shows us nearby events travels much faster than we need to react to those events. In particular, this is true of events, like the approach of predators, partners and food, on our timely reaction to which we and our species depend for our survival. If our eyes made us believe that such events were still future when we saw them, we would not act on them in time; and if they made us believe that they were very past, we would not act on them at all; and either way we would die out. In order to survive in our world we need the default habit of believing that what we see happening is happening now. That is why evolution has bred this habit into us, precisely because, when it matters, the habit makes our senses almost always give us A-beliefs only when they are true.

This completes my tale of what I have called the time of our lives, a tale I have told for two main reasons. First because, although still contentious, I think it is true and, I hope, interesting. My other reason is this. Too many philosophers, especially of the footnotes-to-Plato, French waffle, philosophy-as-therapy and analytic nit-picking schools, conspire with scientists to perpetuate the canard that philosophy never makes progress or settles any questions. The canard arises in part from philosophy's frontier work, of clearing the conceptual ground for new sciences – ranging in the last century from relativity through computer science to theoretical linguistics – and then moving on, so that in many cases the settling of a philosophical question makes it cease *ipso facto* to count as philosophical. But even within philosophy there is still far more progress than some of my colleagues will admit, the philosophy of time being a good example, whether or not what I have said about it here is true.

For just consider the developments in the last hundred years that have advanced and now inform all serious philosophical work on time. First, there is relativity, which has greatly refined our understanding of how time does and does not differ from space, and in particular of how it relates to causation.<sup>14</sup> Then there are new semantic theories of so-called indexicals like 'now' and 'I',<sup>15</sup> which show why our A-series talk of events being past, present or future cannot be translated into non-indexical B-series talk, as B-theorists once thought it could.<sup>16</sup> These theories also show why this untranslatability does not force us *either* to accept the flow of time *or* to reject all our everyday A-series talk as false.

The debate about time has thus been moved on, as it has also been moved on by new work in the philosophy of mind, and especially by the development first of behaviourist and then of functionalist theories of mind, which relate the contents of our beliefs and desires to how they make us act.<sup>17</sup> These theories have shown both how and – combined with the new theory of truth referred to above<sup>18</sup> – why our A-series way of seeing the world is as indispensable as it is irreducible.

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<sup>14</sup> A. Einstein *et al.*, *The Principle of Relativity* (London: Methuen, 1923).

<sup>15</sup> E.g. David Kaplan, 'On the Logic of Demonstratives', *Journal of Philosophical Logic* 8 (1979), 81–98.

<sup>16</sup> See e.g. Perry, *op. cit.*; *Real Time II*, ch. 6.

<sup>17</sup> Peter Smith and O. R. Jones, *The Philosophy of Mind: an Introduction* (Cambridge: Cambridge University Press, 1986), chs 10–13.

<sup>18</sup> Whyte *op. cit.*

Our metaphysical debates about time have also been advanced by philosophical work on meaning and truth,<sup>19</sup> which has shown how the meaning of A-series and B-series statements is related to their so-called truth conditions and thereby, more recently and usefully, to their so-called truthmakers, i.e. to what in the world *makes* such statements, and the beliefs they express, true or false.<sup>20</sup>

And these are just some of the developments inside and outside philosophy that have contributed to the progress the philosophy of time has made since McTaggart's article appeared. There is also a mass of work relating the direction and origin of time to theories of cosmology, causation, decision making, thermodynamics, statistical mechanics and quantum theory. There is all the semantic and metaphysical work on theories of change and identity through time, on the links between theories of time and theories of possibility and necessity, and – as advertisers used to say – much, much more.<sup>21</sup>

Of course some large philosophical questions about time are still open – or at least still debated – but that no more shows a lack of progress than do the ups and downs of atomic theories in physics. Is matter atomic? Well, yes and no, depending on what you mean by an atom. Does time flow? Well, yes and no, depending on what you mean by the flow of time. In both cases the devil, and the progress, is in the details. And just as the last century saw a vast increase in our detailed knowledge of the microstructure of matter, so it saw a vast increase in our detailed philosophical understanding of time. And much of that increase was, as I have tried to show, prompted and enabled by McTaggart's distinction between his A- and B-series, or, as I would put it, between the time of our lives and the time of reality. Anyone who does half as much for the philosophy of time in this century as McTaggart did for it in the last one will have done pretty well.

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<sup>19</sup> E.g. Donald Davidson, 'Truth and Meaning', *Synthese* 17 (1967), 304–323; Kaplan op. cit.

<sup>20</sup> *Real Time II*, chs 2–3.

<sup>21</sup> For an introduction to some of this literature, see for example: 'Time' and related entries in Edward J. Craig (ed.), *Routledge Encyclopedia of Philosophy* (London: Routledge, 1998); Paul Horwich, *Asymmetries in Time: Problems in the Philosophy of Science* (Cambridge, Mass.: MIT Press, 1987); Raymond Flood and Michael Lockwood (eds), *The Nature of Time* (Oxford: Blackwell, 1986); Jeremy Butterfield (ed.), *The Arguments of Time* (Oxford: Oxford University Press, 2000).