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REAL TIME II: REPLIES TO
HINCHLIFF, PAUL AND PERRY

I'd like to start by thanking the organisers of this symposium, and especially Nathan Oaklander, to whom I and all other B-theorists are also indebted for his most effective championing of our cause over many years. I'm also very grateful to all my three commentators, both for their kind remarks about my book, and for the time and trouble they've taken to produce such important and incisive comments. I hope therefore that they will forgive me if, in order to leave as much time as possible for general discussion, I reply only briefly, and only to their main criticisms, leaving unstated, but not unappreciated, our points of agreement.

Mark Hinchliff

I start with Mark Hinchliff. As an unregenerate presentist, Mark offers one main objection to my argument against A-truthmakers. We both agree that if the A-fact that e is past is what makes tokens of the A-proposition that e is past true, then tokens of that proposition produced before e, when they are false, must become true after e, when the fact that e is past comes into existence. This implies for example that an undertaker who mistakenly buries me alive will have his then false token belief – that my life is past – made true later by the fatal consequence of his mistake. I deny this – and so I hope will the jury when the undertaker is subsequently tried for acting with criminal negligence on a culpably false belief! More seriously, and more generally, to suppose as Mark does – since he has to – that my undertaker's false token belief is made posthumously true by my death is to take the truth values of indexical tokens to be fixed not by when or where they occur, or by who produces them, but by when, where or by whom their truth values are assessed.

With all due respect to Mark, this view still seems to me obviously absurd. If you phone me to say 'I have a headache: it's so hot here in Mexico', I will not reject that token statement of yours as false because *I* have no headache and am not in Mexico. And it seems no less obvious to me that premature and therefore false tokens of 'e is past' do *not* become true when – and just because – e *is* now past. Yet unless they do, that A-fact cannot be what gives those tokens their truth values. And if it is not, then we have no reason to postulate it or any other A-truthmaker for A-beliefs and A-utterances.

Mark's other objection is to my new non-temporal-parts B-theory of change. Suppose a thing a has a real changeable property F (like a temperature) at one time t and also at a later time t'. I say the only truthmakers here have the same two constituents – a and F – with t and t' being not *constituents* of these two a-is-F facts (as I shall call them) but merely their temporal locations. And then I say that for a to *change* from being F at t to not being F at t' is for a to *be* at t' – by having some other property there – but for there to be no a-is-F-fact at t'.

To this account of change Mark objects that it makes F what he calls a 'relativised property', i.e. one which a thing can only have relative to something else, in this case a time, thus making the B-

proposition that *a* is *F* a relativised proposition, i.e. one whose truth value is relative to a time.

Well, I agree that when the B-*sentence* '*a* is *F*' doesn't just mean that *a* is *always* *F*, its truth value is indeed relative to a time. But in that case I don't think this *B*-sentence – unlike the *A*-sentence '*a* is *now* *F*' – expresses a proposition at all. The only B-propositions here that need their own truthmakers are the propositions that *a* is *F* at *t*, *a* is *F* at *t'*, and so on, propositions which I say are made true (or false) by there being (or not being) *a*-is-*F* facts located at those times.

Nor does my theory make *F* a relativised property in Mark's sense. For I deny that *a*'s having this property (when it does) is relative to anything, since none of my *a*-is-*F* facts depends for its *existence* on anything other than spacetime. Different instances of *F* do of course need different spacetime *locations*; but then so do different qualitatively identical electrons, and no one infers from this that being an electron is a relativised property. And if it isn't, then nor is *F*.

The fact that different B-truthmakers, like my *a*-is-*F*-facts, are *located* at different times doesn't mean that only at those times is it true to say – tenselessly – that they *exist*, i.e. that their *existence* is relative to those times. It isn't – and it doesn't need to be in order for these B-facts to give the *A*-proposition, that *a* is *now F*, all its temporally variable truth values: since all that requires is that *a*-is-*F* *fact*s be located at all and only the B-times at which this A-proposition is true.

Finally, in a note added after the sesssion, Mark asks why my truthmaker for 'the candle is bent at *t*', namely a candle-is-bent fact located at *t*, doesn't also make true 'the candle is bent'. The answer is, as I have said, that *B*-sentences of this form '*a* is *F*' (as opposed to '*a* is *always F*') have no truthmakers because they have no truth values, since they express no propositions.

So I still see nothing wrong with my new B-theory of change. I continue to think that it squares a very old circle by letting *a* itself, and not just temporal parts of *a*, have a monadic property *F* at some B-times and not at others, without contradiction.

Laurie Paul

Turning now to Laurie Paul's comments, she is of course right to say that much of my theory of time depends on my theory of causation. The dependence goes the other way too, since I give other grounds for rejecting the A-theory of time and hence all theories of causation – like John Mackie's (1974 ch. 7) – which assume it. However, as Laurie isn't an A-theorist, we needn't discuss A-theories of causation, and so I can turn directly to her main objections to my B-theory.

First, there are her apparent counter-examples to my claim that causes must raise the chances of their effects. I argue that causes must do this if causation is to keep enough of its consequences to be worth calling 'causation', and in particular to make causes *ipso facto* explain, be evidence for, and means to, their effects. (This incidentally – since Laurie raises the question in a footnote – is why I deny that causation is transitive, because I think transitivity fails for all these connotations, and I see no independent reason to accept it. It is after all what generates all those incredible cases of storms being caused by the flapping of butterfly wings.) I do however accept that causation is *dense* – i.e. that there is no unmediated causation at a distance – for reasons which I give in *The Facts of Causation* though not in *Real Time II*; and this, as Laurie notes that Peter Menzies (1989) has shown, enables us to reject her so-called 'early pre-emption' counter-examples.

However, as she says, denseness will not dispose of her *late* pre-emption examples, and these I

would in fact deal with much as she would. For if – in her example – I say that Vicky dies because Fred shoots her, my B-statement of the effect, 'Vicky dies', must, if Vicky is mortal, be elliptical. I must mean something like 'Vicky dies when she does' and this will indeed have a higher chance of being true for *some* time interval that spans her death if Fred shoots her when he does than if he doesn't. And then, since a fact about Fred's shot (namely when it occurs) causes a fact about Vicky's death (namely when *it* occurs), it follows on my theory of causation that his shot causes her death, or at least affects it, by causing it to occur earlier than it otherwise would.[1]

Yet Laurie says, puzzlingly, that I may not want to accept solutions of this kind because I 'want to reduce temporal relations to causal relations and thus in general reject assessment of probabilities of facts at particular times'. But I do no such thing. For a start, I don't think that temporal relations *do* reduce to causal ones, if only because quantitative relations like *being ten minutes later than* don't. All causation does for me, as Laurie notes, is distinguish time from space, give it its direction and make it the dimension of change. That I admit is quite a lot; but it isn't everything, and in particular, it isn't anything metric.

Secondly, since we can use many other causes and effects to identify the spacetime region in which Fred fires (or fails to fire) his shot, I can and do say that Vicky's dying when she does has a chance in that region (the chance that is a property of facts located there) which can easily differ from its chances in other regions, such as the much greater chance that her dying when she does has at the time and place at which Fred's bullet enters her body. So I can easily accept solutions to late pre-emption problems of the kind that Laurie proposes.

Next, Laurie objects to my use of causation to individuate the facts which I say are causes and effects. To this I reply first that a criterion of identity is no more needed for all facts or all events than for all the concrete particulars, ranging from viruses through people and mountains to galaxies, whose lack of

clear identity criteria leads nobody to doubt their existence. The fact is that entities don't *need* identity *criteria* – they just need *identity*, which comes free. Calling facts that we can use to individuate entities of a given kind (like facts about people's spacetime locations) 'criteria of identity' doesn't make those facts essential to those entities. Laurie's world-line, useful as it is for distinguishing her from other people, is not what makes her the person she is.

I hijacked Davidson's (1969) causal criterion of identity for causes and effects to show *ad hominem* that it works just as well for my facts as it does for his events, and also to show what's wrong with his slingshot argument against facts (Davidson 1967). But you don't really need an identity criterion for facts to reject Davidson's slingshot: you need only reject one or both of its two assumptions, simply because neither is obviously true, and they do have obviously false consequences.

Actually I did more than that in *The Facts of Causation*, since the opacity of probability statements let me use my chance-raising condition on causation to show when and why the transparency assumption of Davidson's slingshot fails. But that is a bonus, and irrelevant to my reply to Laurie: namely, that there is nothing wrong with theories of causation, like Davidson's and mine, which postulate causal relata with causal criteria of identity. That is no more viciously circular than scientific theories postulating entities, like fundamental particles, with criteria of identity (if any) that only they can supply. Theories and criteria of identity for the entities they postulate can, and often do, come as package deals, and are none the worse for that.

Nor does my causal criterion entail, as Laurie thinks, that a given fact could not have different causes or effects – any more than a world-line criterion of her identity implies that she had to be here

today. All my criterion says is that a fact D is identical with a fact D' if D and D' *actually* have all the same causes and effects: it says nothing about how different that fact's causes or effects *could* be without making it a different fact. So in particular, it doesn't stop an effect E of a cause C being the very same fact in those nearby non-C worlds where I say not-C must give E a lower chance than C gives it in our world. In other words, mine is a criterion only of *actual*, not of *counterfactual*, identity; and again, none the worse for that. No one thinks our metaphysics of particulars is incomplete because we cannot say in general how different a galaxy, a mountain, a person or a virus could be without losing its identity; and what's sauce for those particular geese must surely be sauce and for my factual ganders.[2]

Finally, backward causation and backward time travel, which I say cannot happen because they entail causal loops that I argue are impossible. We can of course describe worlds with such loops, as Laurie does, just as we can describe worlds with barbers who shave all and only those who don't shave themselves. That doesn't show that these imaginary worlds are *possible*, and I say they're not. Take the simplest case, in which two facts C and E cause each other. This on

my theory requires E to have chances with and without C, which are properties of facts where C is, and C to have chances with and without E, which are properties of facts where E is. So here we have four chances: actual and counterfactual chances of E and of C, located in two different parts of spacetime. I therefore make what I shall now call the 'Humean' assumption that none of these chances can entail *anything* about the others, an assumption I stated properly on p. 132 of *Real Time II* but then for brevity unfortunately expressed by calling these chances 'logically independent'.

But that description of them is too weak, as Laurie points out, since even in a causal loop no *one* value of any of my four chances need be entailed by the other three, and in that sense they can be logically independent. Many combinations of them are indeed compatible with a causal loop. But not *all* combinations of them, which is what I meant by calling them logically independent and will now mean by calling them *Humeanly* independent. And from this assumption, that all individually possible values of any effect's actual and counterfactual chances must be compatible with each other and with those of all its causes, it is easy to show, as I do, that there can be no causal loops – a fact which on my theory of time is embodied in time's local and global linearity.

Still, of course, as one man's *modus ponens* is another woman's *modus tollens*, you can always infer from this not that causation – and therefore time – must be linear, but that my four chances need not be Humeanly independent. But why do that, when no one believes in causal loops anyway? So why not accept the best possible explanation of their agreed non-existence: namely, a credible and independently motivated theory which makes them impossible – thereby, as a bonus, explaining why time must have the linear topology we all think it does have – a topology which is after all by no means obviously contingent.

John Perry

Finally, I turn to John Perry, to whose work my theory of time owes a lot. I first met John in Stanford in the late seventies, when I was working on *Real Time I* and he was writing his seminal 'Problem of the essential indexical' (1979). That was the work which showed me why we agents need irreducible A-beliefs, which any acceptable B-theory of time must therefore let us have.

(My only regret about our discussions then, by the way, was my failure to persuade John to replace his supermarket trolley example with a *Winnie-the-Pooh* story of Pooh and Piglet finding that the snow

tracks they've been nervously following round a spinney were in fact made by themselves. He declined, on the grounds that the story wasn't well enough known to American philosophers; but it would have been, if he'd used it.)

I was therefore not at all surprised to find myself agreeing completely with John's refutation of Frank Jackson's (1986) knowledge argument for non-

physical facts, and of its temporal and spatial counterparts. About those comments of his I have nothing to say – except that he's dead right. So I hope he will forgive me if I don't yet accept his positive account of knowing what experiences are like. For I still prefer the view of Laurence Nemirow (1990), David Lewis (1988) and others that knowing what experiences are like is not knowing *that* something but knowing *how* something, namely how to imagine, recognise and recollect such experiences.

One of my reasons for this preference, which I've given elsewhere, is our inability to say in non-demonstrative terms *what* we know when we know what experiences of a certain kind are like. In saying this I don't of course mean to deny that we

> have words for properties of experiences, like a 'loud' noise, a 'sweet' taste, a 'warm' feeling: we can say a lot about our experiences. Yet we can say nothing about what they are *like*. What does middle C sound like, sugar taste like, warmth feel like? We cannot say. All we can say is that these experiences are more or less like, i.e. similar to, certain other experiences. But that does not tell us what, in the relevant *non*-relational sense of 'like', any one of a set of similar experiences *is* like. This inability to say what our experiences are like would be a complete mystery if knowing what they are like were knowing … that certain propositions are true (Mellor 1993 p. 8).

Whereas if this knowledge is a kind of know-how our inability to say what we know is not mysterious at all. 'In this respect it is like knowing how to ride a bicycle. I cannot state the [proposition] I know then either, because there is no such [proposition] to state.' And similarly, I believe, with my knowing what it's like to see red. I think the reason I can't state the propositional content of that knowledge is simple: it has none. This is why I think that even non-physicalists like me should accept a know-how theory of knowing what experiences are like. While to an admittedly 'antecedent' – i.e. religiously dogmatic! – physicalist like John, since a know-how theory also postulates no non-physical facts, it should at least provide an acceptable backup to his preferred physicalist know-that theory.

These two theories of what experiences are like also illustrate a general point that I owe to my Cambridge colleague Peter Kail, and with which I'd like to finish, since it rarely gets the attention it deserves. The point is that so-called 'anti-realist' or 'projectivist' theories of various subject matters come in at least two, quite different, kinds. Some, like the know-how theory of knowing what it's like, deny that our apparent knowledge of an apparent subject matter consists of beliefs at all, never mind true ones. Others, like John's theory of knowing what it's like, or my B-theory of our A-knowledge, do take that knowledge to consist

of true beliefs: they just deny that those beliefs are made true by corresponding facts, whether those be non-physical facts about qualia or A-facts about things being past, present or future.

These theories are therefore anti-realist only in the sense of denying that the apparent subject matter of these apparent beliefs exists. They are not anti-realist in the sense of denying that these apparent beliefs are *beliefs*, with distinctive contents, and with the truth values that everyone thinks they have. So these theories in general, and my B-theory of our A-knowledge in particular, are neither non-cognitivist nor error theories. We do not err in believing now that this meeting is present, was future and will be past: those token A-beliefs of ours are all true. The only error lies in the view of Mark and his fellow A-theorists that these beliefs are *made* true by the A-facts that this meeting has the properties respectively of being present, of being future-in-the-past and of being past-in-the-future. This is why I agree with John that we can deny the existence of all such A-facts without denying any of the A-knowledge that we all obviously have.

NOTES

[1] Whether Fred's shot causes or only affects Vicky's death depends in my theory on whether her death would be the same event if it coccurred later, i.e. on whether when this (or any other) event occurs is an essential fact about it (see chapter 12 of *The Facts of Causation*). I doubt it, but need not argue the point here, since the difference – if any – between essential and inessential facts about particulars makes no difference to their *causation*.

[2] And for Davidson's events, for which I see no need to say in general how far their counterfactual identity depends on when or where they occur: see footnote 1 above.

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