

A. A. Rini and M. J. Cresswell

The World-Time Parallel. Tense and Modality in Logic and Metaphysics.

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This book advertises itself as an exploration of the world-time parallel, that is, the parallel between the modal dimension, on the one hand, and the temporal dimension, on the other. It is that, and much more. As the authors point out, there is reasonable agreement that we can model times, through temporal logic, in ways that are analogous to those by which we model modality through the logic of possible worlds. But this formal parallel has almost universally been taken to be *merely* a formal parallel, that is to say, the assumption has been that no metaphysical conclusions ought to be drawn from it. Thus, it is generally thought that one is free to accept an argument for actualism, say, but to reject a parallel argument for presentism. Rini and Cresswell compellingly argue that this is a mistake: the temporal and the modal are more than merely formally analogous.

Abstracting from the interesting central question about the status of the world-time parallel, this book is of interest to anyone who desires clarity about propositional content, *de se* knowledge (and indexicality more generally) and of course tense and modality. In part because the authors do not wish to prejudge any metaphysical disputes—in particular they do not want to take a stand on whether one ought to be a possibilist rather than an actualist, or an eternalist rather than a presentist—they scrupulously offer very careful explications of current actualist and possibilist modal semantics as well as eternalist and presentist tense semantics. The book is rich with careful detail. It is full of places where various confusions are cleared away. Indeed, there is so much packed into the various discussions that it is difficult to know where to start a review. So rather than try and offer a very potted cook's tour of the book, in what follows I offer just a small taste of one of the issues canvassed.

Rini and Cresswell make what appears to be a startling claim. For it seems natural, at least to many, to treat the modal dimension metaphysically differently to the temporal dimension. Events and objects that were, or will be, located at other times are things to which we, at this time, are, or will be, causally connected. Other times are locations to which we could, in principle, travel. Events and objects in other worlds are not things to which we are, or will be, causally connected. Other worlds are not places to which we can, in principle, travel.

Accordingly, even possibilist eternalists are inclined to say that that you and I are mereological fusions of objects at different times (we are fusions of temporal parts and hence we are four-dimensional objects) but are inclined to reject the analogous contention that you and I are fusions of objects in other possible worlds and thus composed of a set of modal parts. Perhaps the intuition is that it is a conceptual truth that objects do not have parts that are entirely spatio-temporally disconnected from one another, and thus do not have modal parts. Or perhaps the thought is that while there is a sense in which what I do, have done, and will do, is, at least, in part, within my powers, what some other object does in some other world is not something over which I have any control, and thus that object cannot be a part of *me*.

Thus the apparent disanalogy between the modal and the temporal dimension seems partly grounded in the absence of spatio-temporal cum causal connections between things located across the modal dimension. For it is this difference that could, in turn, ground the possibility of temporal journeys but not modal journeys, and the possibility of causally affecting other times but not other worlds.

Examining time travel, on the one hand, and modal travel, on the other, ought, then, to be instructive in determining whether such a disanalogy does indeed exist. Rini and Cresswell introduce two stories (110-111). The first is a time travel scenario involving Buggy. On Saturday at noon Buggy is hanging out when someone, Buggy*, appears out of nowhere with what seem to him to be memories of a later time from which he has travelled. Subsequently Buggy* vanishes. At noon on Sunday Buggy* vanishes, only to reappear again just after noon with apparent memories of having visited himself on Saturday. Buggy is a time traveller who travels back from Sunday noon to Saturday noon only if the appearance of Buggy* at noon on Saturday is appropriately causally connected to the vanishing of Buggy* on Sunday.

Now consider a second story. In the actual world, w , Buggy falls asleep throughout Sunday. In a world, w' , there exists a person, Buggy* whose memories of times before Sunday are just like Buggy's. After Sunday, Buggy has apparent memories of what happened to Buggy* on Sunday (during the period in which Buggy was asleep).

The second story, Rini and Cresswell maintain, is the modal analogue of the first. They note that, for this to be so, in w Buggy's apparent memories had better not be caused by some events or states of w : if we are to have modal travel then these are, after all, supposed to be memories of events in w' . By analogy though, Buggy*'s apparent memories on Saturday had better not be caused by events prior to Saturday, else he will fail to count as a time traveller.

My first reaction was that the second story clearly does not depict modal travel. So it is worth exploring the case a little further. The intuition that Buggy is not a modal traveller is likely borne from the thought that Buggy does not *go* anywhere. Buggy remains resolutely in the actual world, w . Modal travel, however, would seem to require that there is a journey elsewhere. But there is no actual travel. What might we say to this?

Consider again the time travel story. The way the story was initially laid out there was no mention of travel: all that was said was that there were two person stages, Buggy and Buggy*, at noon on Saturday, and that Buggy* has apparent memories, at that time, of a later time. Moreover, there is a later time, Sunday at noon, at which Buggy* vanishes, and the mental states of Buggy* at that time are relevantly like those of Buggy* on Saturday. Indeed, there are appropriate causal connections between the two. Still, no mention has been made of Buggy* *going anywhere*. There is mention of a particular distribution of person stages at different times. Indeed, in part this case counts as an instance of time travel because were we to order Buggy's person stages (including Buggy on Saturday and Buggy* on Saturday and Sunday) we would find that the ordering of his person stages is different to the ordering of external time into earlier and later than. No stage goes anywhere. Buggy's having travelled consists entirely in him having

different stages at different times: him having *time* travelled consists in those stages being, relative to external time, arranged in a non-standard order.

With this in mind, turn back to our putative case of modal travel. Buggy, in w , does not go anywhere. Each of his person stages is both world-bound and time-bound. But if time travelling Buggy can travel despite having time-bound stages, why can't this Buggy modally travel despite having world-bound stages?

It cannot be sufficient, in order for Buggy to travel modally, that he have modal parts: if Buggy has any modal parts at all, he has modal parts in many worlds. This is analogous to the temporal case: it cannot be sufficient for Buggy to time travel that he has temporal parts. But suppose we are given a set of unordered modal parts just as we might be given a set of unordered temporal parts of a putative time traveller. In each case we are asked to put the parts together into *threads*, where a thread is a series of person stages ordered in the way in which the person stages of ordinary persons are ordered within a world. The thread of a time traveller looks like just the thread of an average person: it looks like time travel only when we plot it against external time. The thread of a modal traveller, if there is any such thing, will look like the thread of an average person: it will look like modal travel only against the backdrop of a set of possible worlds.

Arguably, when we sort Buggy and Buggy*'s stages to create (at least) two threads, A and B, one of those threads, A, will include all of Buggy's stages up until Sunday, and will include Buggy*'s stages in w' on Sunday, and Buggy's stages in w thereafter. We will group the stages in this way, to create thread A, because after Sunday the stages in w (the Buggy stages) seem to have memories that could only be the result of the activities of the Buggy* stages on Sunday. If we match person-stages to create modal threads by matching for similarity, then we will create a modal thread with stages, some of which are in w and some in w' .

If travelling to a time is a matter of having a person stage at that time, then travelling to a world is a matter of having a person stage at that world. And we have at least some grounds for saying that Buggy does indeed have a person stage in w' . There is, then, a sense in which there are appropriate causal connections at play in the purported case of modal travel. Buggy (the object composed of the parts that compose thread A) does have causal contact with w' and his memories are a result of experiencing events in w' : for Buggy has a person stage in w' which does experience those events. Although Buggy's actual parts do not travel to another world, neither do Buggy's present parts travel to another time. What this shows us is that when we noted that events and objects in other worlds are not things to which we are, or will be, causally connected in the way that we are, or will be, causally connected to objects at other times, we were focussing on the wrong comparator claim. It might be that objects at other times are things to which we will be causally connected. But the relevant modal analogue is whether objects in other worlds are things to which we might have been causally connected, not things to which we are or will be causally connected. And here the answer is clearly yes.

Consideration of just these two stories raises interesting questions. Chief among them is a methodological question. We can all agree that there are some disanalogies between the modal case and the temporal case. With respect to the world-time parallel the issue is whether the disanalogies are of a kind that undercut the claims of Rini and Cresswell that the two dimensions

ought to be treated alike metaphysically. What sort of disanalogy threatens Rini and Cresswell's conclusion, and what sort does not? At various points Rini and Cresswell take a stand on why they think any particular disanalogy is irrelevant; but there is a larger question which is one of the few not extensively addressed: what sorts of disanalogies are problematic in concluding that we can draw metaphysical conclusions for the world-time parallel and which are not, and why?

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