

THERE'S NOTHING TO BEAT A BACKWARD CLOCK: A REJOINDER TO ADAMS, BARKER AND CLARKE

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ABSTRACT: Neil Sinhababu and I presented *Backward Clock*, an original counterexample to Robert Nozick's truth-tracking analysis of propositional knowledge. Fred Adams, John Barker and Murray Clarke argue that *Backward Clock* is no such counterexample. Their argument fails to nullify *Backward Clock* which also shows that other tracking analyses, such as Dretske's and one that Adams *et al.* may well have in mind, are inadequate.

KEYWORDS: Dretske, methods, Nozick, sensitive belief, truth-tracking

In "The Backward Clock, Truth-Tracking, and Safety," Neil Sinhababu and I presented *Backward Clock*, an original counterexample to Robert Nozick's truth-tracking analysis of propositional knowledge.¹ In "Beat the (Backward) Clock," Fred Adams, John Barker and Murray Clarke argue that *Backward Clock* is no such counterexample.² Their argument fails to nullify *Backward Clock* which also shows that other tracking analyses, such as Dretske's and one that Adams, Barker and Clarke may well have in mind, are inadequate. When what counts is derailing tracking analyses, there's nothing to beat a backward clock like ours.

1. Nozick's Analysis of Knowledge and the Backward Clock

Among truth-tracking analyses of knowledge we sought to fault only *Nozick's analysis of knowledge*, which we formulated as follows.

S knows that *p*, using method *M* of arriving at a belief whether *p*, just in case

- (1) *p*
- (2) *S* believes, using *M*, that *p*.

¹ John N. Williams and Neil Sinhababu, "The Backward Clock, Truth-Tracking, and Safety," *Journal of Philosophy* 112, 1 (2015): 46–55.

² Fred Adams, John A. Barker and Murray Clarke, "Beat the (Backward) Clock," *Logos & Episteme. An International Journal of Epistemology* VII, 3 (2016): 353–361

- (3) In the closest (that is, most similar) worlds to the actual world in which not-*p* (and in which *S* uses *M*), *S* does not believe that *p*.
- (4) In the closest (that is, most similar) worlds to the actual world in which *p* (and in which *S* uses *M*), *S* believes that *p*.³

There are a couple of things we should note about this analysis. (3) is commonly known as the ‘sensitivity condition,’ meaning that *S*’s belief that *p* is sensitive to falsehood; roughly, she would not have that belief if it were false. (4) is commonly known as the ‘adherence condition,’ meaning that *S*’s belief that *p* adheres to the truth; roughly, were she to have that belief in slightly changed circumstances, then it would still be true. A belief that is both sensitive to falsehood and adherent to truth is said to be ‘truth-tracking.’ The analysis proceeds in terms of a method and requires that (3) invoke the method that *S* actually uses (as mentioned in the *definiendum*) to arrive at her belief that *p*. Nozick introduces methods into his analysis, not as a way of elucidating sensitivity, but in order to avoid a counterexample.⁴ We followed Nozick in taking sensitivity (and indeed adherence and truth-tracking) to be a condition on *S*’s belief that *p*, not on her method *M* of arriving at that belief.⁵ We argued that *S*

³ Williams and Sinhababu, “The Backward Clock,” 46. Our formulation is faithful to Nozick, although it is not *verbatim*. In *Philosophical Explanations* (Cambridge, MA: Harvard University Press, 1981), 179, he says

Let us define a technical locution, *S* knows, via method (or way of believing) *M*, that *p*.

- (1) *p* is true.
- (2) *S* believes, via method or way of coming to believe *M*, that *p*.
- (3) If *p* weren’t true and *S* were to use *M* to arrive at a belief whether (or not) *p*, then *S* wouldn’t believe, via *M*, that *p*.
- (4) If *p* were true and *S* were to use *M* to arrive at a belief whether (or not) *p*, then *S* would believe, via *M*, that *p*.

Although this formulation does not explicitly mention possible worlds, Nozick is clear that his subjunctives (3) and (4) can be expressed as ours and announces that he will sometimes use them that way (*Philosophical Explanations*, 173–174).

⁴ Nozick notes that (3) must be formulated in terms of the method that *S* actually uses, in order to avoid *Grandmother*. A grandmother sees her grandson is well when he comes to visit but if he were too unwell to visit, then relatives would tell her that he is well to spare her upset. She arrives at the true belief that he is well via the method of looking at him, yet if he were unwell then she would still believe that he is well via the *different* method of testimony. So (3) is false, but nonetheless she knows that he is well (*Philosophical Explanations*, 179).

⁵ Nozick says of (3) that “it tells us how his belief state is sensitive to the truth-value of *p*. It tells us how his *belief state* is sensitive to *p*’s falsity, but not how it is sensitive to *p*’s truth” (*Philosophical Explanations*, 176, my italics). We called a belief that satisfies (3), ‘sensitive to falsehood’ or just ‘sensitive’ (Williams and Sinhababu, “The Backward Clock,” 47–48, 51–52 and 55) following common parlance among commentators (for example, Tim Black and Peter Murphy, “In Defense of Sensitivity,” *Synthese* 154, 1 (2007): 53–71, 54 and 58, Rachael Briggs

There's Nothing to Beat a Backward Clock: A Rejoinder to Adams, Barker and Clarke does not know that p in *Backward Clock*, but that this example satisfies (1)-(4), thus showing that Nozick's analysis, as given above, is too weak, predicting knowledge where there is ignorance. In order to support this claim, we first gave two other examples, *Normal Clock* and *Stopped Clock*.

We described *Normal Clock* as follows.

You habitually nap between 4 pm and 5 pm. Your method of ascertaining the time you wake is to look at your clock, one you know has always worked perfectly reliably. This clock is analogue so its hands sweep its face continuously. However, it has no second hand. Awakening at 4:30 pm, you see that its hands point to 4:30 pm. Accordingly, you form the belief that it is 4:30 pm. And it is indeed 4:30 pm because the clock has continued to work perfectly reliably.⁶

There is the oddity of the missing second hand. We left it off to ensure parity with *Stopped Clock* and *Backward Clock*, to be described shortly. Let us postpone examining this oddity until the next section. Your true belief that it is 4:30 pm is sensitive to falsehood. Had it been any time other than 4:30 pm when you looked at the clock, then you would not believe that it is 4:30 pm. Your true belief that it is 4:30 pm is also truth-adherent. Had you looked at the clock at 4:30

and Daniel Nolan, "Mad, Bad and Dangerous to Know," *Analysis* 72, 2 (2012): 314–16, Keith DeRose, "Solving the Skeptical Problem," in *Skepticism: A Contemporary Reader*, ed. Keith DeRose and Ted A. Warfield (New York: Oxford University Press, 1999), 197, Lars Gundersen, "Tracking, Epistemic Dispositions and the Conditional Analysis," *Erkenntnis* 72, 3 (2010): 358, David Manley, "Safety, Content, Apriority, Self-Knowledge," *Journal of Philosophy* 104, 8, (2007): 419 and Duncan Pritchard, "Anti-Luck Virtue Epistemology," *Journal of Philosophy* 109, 3 (2012): 247–79 and 250–254. For Nozick, a belief that is sensitive to truth is what he later calls 'adherent' (*Philosophical Explanations*, 212) or as we put it, 'truth-adherent' (Williams and Sinhababu, "The Backward Clock," 49, 51 and 55). Nozick tells us that "Perfect sensitivity would involve *beliefs* and facts varying together" (*Philosophical Explanations*, 176, my italics). He then says "Let us say of a person who believes that p , which is true, that when 3 and 4 hold, his *belief* tracks the truth that p " (*Philosophical Explanations*, 17, my italics). So against Tristan Haze ("Reply to Adams and Clarke," *Logos & Episteme. An International Journal of Epistemology* VII, 2 (2016): 224, note 11) talk of 'tracking the truth,' does appear in Nozick's official account, although not in his analysis. Haze independently hits the nail on the head by observing that "we cannot properly say: the account requires that the method M tracks the truth in general. That is a mischaracterization of Nozick's theory" (Haze, "Reply to Adams and Clarke," 224, note 11). The conjunction of 3 and 4 holding is also what commentators mean by a 'truth-tracking' belief (for example Gundersen, "Tracking," 358 and Raymond Martin, "Tracking Nozick's Sceptic: A Better Method," *Analysis* 43, 1 (1983): 28–33). Notice that for Nozick, as for us and his other commentators, it is *beliefs* that are sensitive to falsehood, not methods or ways. For Nozick, as for us and his other commentators, it is *beliefs* that are truth-adherent or truth-tracking, not methods or ways. This will become important in section 6.

⁶ Williams and Sinhababu, "The Backward Clock," 46–47.

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pm while being slightly closer to it, then you would still believe that it is 4:30 pm. So far so good for Nozick's analysis, because surely you do know that it is 4:30 pm. Adams, Barker and Clarke do not contest this.⁷

Then we described *Stopped Clock* as follows.

You habitually nap between 4 pm and 5 pm. Your method of ascertaining the time you wake is to look at your clock, one you know has always worked perfectly reliably. Like *Normal Clock*, it has an analogue design so its hands are supposed to sweep its face continuously. However, it has no second hand. Awakening at 4:30 pm, you see that its hands point to 4:30 pm. Accordingly, you form the belief that it is 4:30 pm. And it is indeed 4:30 pm because exactly twenty-four hours ago a stray fleck of dust chanced to enter the clock's mechanism, stopping it.⁸

Your belief that it is 4:30 pm is insensitive to falsehood. If it were not 4:30 pm but some other time, then by looking at the clock you would still believe – but then falsely – that it is 4:30 pm. This is more good news for Nozick's analysis, since surely you do not know that it is 4:30 pm. One very plausible explanation of your ignorance is that your belief is luckily true. You were lucky to look at the clock exactly twenty-four hours after it stopped working, at the only instant during the hour when you nap at which its hands could have pointed to the correct time. Adams, Barker and Clarke do not contest this either.⁹

Finally, we described *Backward Clock* as follows.

You habitually nap between 4 pm and 5 pm. Your method of ascertaining the time you wake is to look at your clock, one you know has always worked perfectly reliably. Unbeknownst to you, your clock is a special model designed by a cult that regards the hour starting from 4 pm today as cursed, and wants clocks not to run forwards during that hour. So your clock is designed to run perfectly reliably backwards during that hour. At 4 pm the hands of the clock jumped to 5 pm, and it has been running reliably backwards since then. This clock is analogue so its hands sweep its face continuously, but it has no second hand so you cannot tell that it is running backwards from a quick glance.

⁷ They say that "all conditions of the tracking theories are met and there is no counter-example" (Adams, Barker and Clarke, "Beat the Clock," 355). By the plural 'theories' they mean Nozick's and Fred Dretske's early 1971 theory, to be discussed in section 5. We nowhere mentioned Dretske. More importantly, their understanding of Nozick's theory does not coincide with ours or any of the commentators I mention in note 5. In fact the tracking theory they defend is not Nozick's, as I will show in sections 1 and 6.

⁸ Williams and Sinhababu, "The Backward Clock," 47.

⁹ Of our observation that you do not know that it is 4:30 pm in *Stopped Clock*, they say that "we agree with this assessment" (Adams, Barker and Clarke, "Beat the Clock," 355).

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Awaking, you look at the clock at exactly 4:30 pm and observe that its hands point to 4:30 pm. Accordingly, you form the belief that it is 4:30 pm.¹⁰

As in *Stopped Clock*, your true belief that it is 4:30 pm is luckily true, for in both cases you were lucky to look at it at exactly 4:30 pm, at the only instant during the hour when you nap at which its hands could have pointed to the correct time. Thus in both cases you do not know that it is 4:30 pm. Your belief is also truth-adherent. Had you looked at the clock at 4:30 pm while being slightly closer to it, then you would still believe that it is 4:30 pm. In other words, in worlds close to the actual world in which it is 4:30 pm (and in which you look at your clock to tell the time), you believe that it is 4:30 pm.

But unlike in *Stopped Clock*, your belief that it is 4:30 pm is sensitive to falsehood, or in other words, satisfies (3). If it were not 4:30 pm but some other time, then by looking at the clock you would not believe that it is 4:30 pm. Instead you would form *some other false belief* about what time it is. For example, if you had looked at it at 4:31 pm, then you would not form the false belief that it is 4:30 pm. Instead you would form the false belief that it is 4:29 pm. To satisfy (3), you need not form a true belief about what time it is in the counterfactual situation (as you do in *Normal Clock*). You only need to fail to form a particular false belief – perhaps, by forming a different false belief about what time it is instead (as you do in *Backward Clock*). It is worth noting that *Backward Clock* can be seen to satisfy (3) without using the term ‘sensitive:’ in worlds close to the actual world in which it is not 4:30 pm but, say, 4:31 pm, and in which you look at your clock to tell the time, you do not believe that it is 4:30 pm. Instead you believe that it is 4:29 pm. Thus Nozick’s analysis is too weak, predicting knowledge where there is none.

It is far from obvious that Adams, Barker and Clarke contest any of this either. While they tell us that our “claim to have devised a counter-example ... is not true,”¹¹ they do not dispute the fact that your belief that it is 4:30 pm is truth-adherent, saying that that “Nozick’s *adherence* condition ... is not relevant to the example.”¹² They do not dispute the fact that you have a true belief that it is 4:30 pm, saying that “the person awaking from the nap happens to acquire a true belief that it is 4:30.”¹³ They do not dispute the fact that you do not know that it is 4:30 pm, saying that “the *reason that the subject lacks knowledge* is that neither the clock nor his belief is tracking the truth.”¹⁴ So if they contest anything, they must

¹⁰ Williams and Sinhababu, “The Backward Clock,” 48.

¹¹ Adams, Barker and Clarke, “Beat the Clock,” 353.

¹² Adams, Barker and Clarke, “Beat the Clock,” 354, note 7.

¹³ Adams, Barker and Clarke, “Beat the Clock,” 359.

¹⁴ Adams, Barker and Clarke, “Beat the Clock,” 359, my italics.

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dispute the fact that (3) is true of your belief that it is 4:30 pm. They do not dispute this in so many words. The nearest they come to disputing it is in the following passage.

Now W&S will no doubt insist “but at 4:30 it is still true that it would not display ‘4:30’ unless it were actually 4:30”. ...the clock’s display is equivocal even if the clock wouldn’t display ‘4:30’ unless the time were 4:30. No naïve reader could differentiate the true from the false clock displays during that hour.¹⁵

This might make us suspect that Adams, Barker and Clarke are defending a different tracking theory from Nozick’s. This is further confirmed by the fact that they argue that you do not have a truth-tracking *method* of forming the belief that it is 4:30 pm.¹⁶ But Nozick’s analysis is not elucidated in terms of a truth-tracking *method*, but in terms of a truth-tracking *belief*. I will return to this point in section 6. First however, let us examine their objections (but not quite in the order they give them).

2. No Second Hand on the Clocks? – No Problem

There is no second hand on any of the three clocks. Adams, Barker and Clarke comment that

We suspect that they designed all the examples this way because they thought that if a subject observed the backward clock second-hand going backwards, the subject might not trust the clock.¹⁷

This is correct provided ‘trust’ is read as ‘believe.’ In fact, one reason why we left the second hand off *Backward Clock* is because in a realistic case in which you look at where its hands are pointing, you would recognize that it is running backwards. But then you would not believe that it is 4:30 pm, so we would have no counterexample.¹⁸ We wanted to maximize parity among the three clocks. So we left the second hand off *Normal Clock* and *Stopped Clock* as well.

¹⁵ Adams, Barker and Clarke, “Beat the Clock,” 358-359.

¹⁶ For example, “So the method (or reason) that gives rise to the subject’s belief is not a truth-tracking *method* (or reason), for it is too equivocal to yield knowledge.” (Adams, Barker and Clarke, “Beat the Clock,” 359, my italics)

¹⁷ Adams, Barker and Clarke, “Beat the Clock,” 356.

¹⁸ There is a second reason as well. Relatedly, we anticipated an objection as follows

It might also be claimed that in *Backward Clock* you are not justified in forming any belief about what time it is by looking at the clock during its backward-running hour, because to be so justified you would have to check that its hands are still moving forwards (Williams and Sinhababu, “The Backward Clock,” 50).

Adams, Barker and Clarke now object that

since the subject cannot see when the second-hand hits '12,' the subject could never use this clock to know that it is exactly 4:30 p.m. Hence, this is a serious defect in their example.¹⁹

This objection is misstated. It cannot be that in *Backward Clock* you cannot *know* that it is 4:30 pm. This is true (because your belief that it is 4:30 pm is luckily true) yet (1)-(4) are all true. That putative objection is a vindication! More charitably, Adams, Barker and Clarke might mean that you wouldn't acquire the *belief* that it is 4:30 pm, because that would be the belief that it is *exactly* 4:30 pm, and you wouldn't come to *that* belief by looking at the position of the hands when you wake. This robs us of a counterexample.

I have two responses to this objection. Firstly, you might indeed come to believe that it is exactly 4:30 pm by observing the position of the hands when you wake. We may stipulate (as with *Normal Clock* and *Stopped Clock*) that you are close enough to the clock to see exactly where its hour and minute hands are pointing, and as you glance at it, you observe that its minute hand points exactly at the numeral 6 and its hour hand points exactly at the point equidistant in the arc from the numeral 4 to the numeral 5. Alternatively, we could stipulate that *Normal Clock* and *Stopped Clock* have a second hand that ticks forwards in discreet one-second jumps. In the hour that you nap, *Backward Clock's* second hand ticks backwards in discreet one-second jumps. In each case you wake and observe the position of the hands of your clock. In *Normal Clock* and *Backward Clock* you observe the second hand of your clock at the instant it has ticked to the numeral 12 and then look away before it ticks past it.

Secondly, suppose (counterfactually) that the absence of the second hand *does* mean that you can only know that it is approximately 4:30 pm. Let us stipulate that you take 'approximately t ' to mean 'within the period from (and including) t minus one minute to (and including) t plus one minute.' On this stipulation, approximate times include but do not exhaust exact times. Also suppose that you are cautious enough to form beliefs only about approximate times. In *Backward Clock* you wake and at exactly 4:29 pm observe the hands of your clock pointing to approximately 4:30 pm, so that its hour hand points to somewhere close to the point equidistant in the arc from the numerals 4 to 5 and its minute hand points to somewhere very close to the numeral 6. Accordingly,

We thought that we would be more saliently vulnerable to that objection had we kept the second hand on *Backward Clock*. But even if you are not justified in believing that it is not 4:30 pm, this will not save Nozick's analysis, because it does not mention justification.

¹⁹Adams, Barker and Clarke, "Beat the Clock," 356.

you form the true belief that it is approximately 4:30 pm. You do not know this because your belief is luckily true. You were lucky to look at it at between 4:29 pm and 4:31 pm, this being the only period of the hour when you nap during which its hands could have pointed to the approximately correct time. But now (3) is true. If it were not approximately 4:30 pm but say, exactly 4:32 pm, then you wouldn't believe that it was approximately 4:30 pm. Instead you would believe that it is approximately 4:28 pm. Once again Nozick's analysis predicts knowledge where there is ignorance.

3. The Irrelevant Intentions of the Cult

Adams, Barker and Clarke single out our explanation of why *Backward Clock* runs perfectly reliably backwards from 5 pm to 4 pm. This was that "your clock is a special model designed by a cult that regards the hour starting from 4 pm today as cursed, and wants clocks not to run forwards during that hour."²⁰ They say that this may be given one of two 'interpretations.'²¹ The first of these is that the cult intends to deceive you into holding false beliefs about the time, or as they put it, "to say something false, i.e. to *lie*, about the time."²² The second is that it intends it for its own use to tell the time during the cursed hour. They then argue that on either interpretation we are left with no counterexample.

Of the second interpretation (this would be more accurately called a speculation about the cult's intentions), they write that

The ordinary person, call her Betty, would be unable to determine what the clock is saying during the hour between 4:00 and 5:00. When the clock displays '4:35,' it is saying that the correct time is 4:25, and when it displays '4:25,' it is saying that the correct time is 4:35. It so happens that when the clock displays '4:30,' it is saying that the correct time is 4:30, but Betty would have no way of telling that this is what it is saying.²³

We nowhere use the metaphor 'say' in any of our discussion of any of the clocks. Adams, Barker and Clarke appear to think that for you to know what the clock 'says' is to know how to use your observations of the positions of its hands in order to know what time it is. This means that you must know not only what positions these are but also how such positions are intended to represent the time. Of course the cult, but not you, knows that. If you were to look at the clock at 4:25 pm, you would think that the position of its hands are intended to represent

²⁰ Williams and Sinhababu, "The Backward Clock," 48.

²¹ Adams, Barker and Clarke, "Beat the Clock," 357.

²² Adams, Barker and Clarke, "Beat the Clock," 357.

²³ Adams, Barker and Clarke, "Beat the Clock," 357.

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the time as being 4:25 pm, whereas they are intended to represent the time as being 4:35 pm. But when you look at it at 4:30 pm, the cult does indeed intend the position of its hands to represent the time as being 4:30 pm. After all, they designed the clock to run perfectly reliably backwards from 5:00 pm to 4:00 pm. So now your understanding of what the position of the hands represents coincides exactly with what the cult intends, although you don't know that. But then Adams, Barker and Clarke immediately conclude that

She would form the belief that it is 4:30, but in virtue of the fact that she wouldn't understand what the clock is saying, it would be merely a *chronometric accident or a coincidence* that this belief would be true.²⁴

I agree, but I fail to see how this deprives us of a counterexample to Nozick's analysis. Your (or her) belief that it is 4:30 pm is coincidentally or luckily true (the time that you look at your clock coinciding with the only time during the hour that you nap that its hands could have pointed to the correct time), with the result that you do not know that it is 4:30 pm. But (3) is true. To repeat, in worlds close to the actual world in which it is not 4:30 pm (but, say, 4:31 pm) and in which you look at your clock to tell the time, you do not believe that it is 4:30 pm. Instead you believe that it is 4:29 pm.

Of the first interpretation of the cult's intentions, that it intends to 'lie' to you about the time, Adams, Barker and Clarke say that this "scheme was flawed, for it failed to say something false about the time at 4:30."²⁵ They continue that this

... mistake wouldn't enable you to learn the correct time at 4:30. As Dretske pointed out, "If your reasons for believing P are such that you might have them when P is false, then they aren't good enough to know that P is true ..."²⁶

At this point Adams, Barker and Clarke appear to defend Dretske's early analysis of knowledge, not Nozick's, because (1)-(4) do not mention reasons, let alone incorporate Dretske's conditional. So the best that they may claim is that Dretske's analysis, rather than Nozick's, survives *Backward Clock*. I will show in section 5 that it doesn't survive it either.

However I agree that you couldn't learn that it is 4:30 pm, because whatever you learn you know and you can't know that it is 4:30 pm because your belief that it is 4:30 pm is luckily true. Once again our counterexample to Nozick's analysis is unscathed, since (1)-(4) remain true.

²⁴Adams, Barker and Clarke, "Beat the Clock," 357, my italics.

²⁵Adams, Barker and Clarke, "Beat the Clock," 357.

²⁶Adams, Barker and Clarke, "Beat the Clock," 358.

Adams, Barker and Clarke conclude, naming the cult's clock designer 'Ted', that

The clock in the Normal Clock case wouldn't have said that the time was 4:30 by displaying '4:30' if it hadn't been 4:30. Ted's clock, however, might have done this even if it hadn't been 4:30.²⁷

This last claim is simply false. We stipulated that in the actual world, the clock runs perfectly reliably backwards from 5:00 pm to 4:00 pm. So the only time at which its hands can point to 4:30 pm is when it is 4:30 pm. Adams, Barker and Clarke point out that the cult could design the clock so its hands wouldn't point to the correct time at any time during the hour that you nap (say, by making it run backwards more slowly).²⁸ Perhaps they had that possibility in mind. But as we described *Backward Clock*, worlds close to the *actual* circumstances in which you look at it cannot include those in which its *mechanism* differs from that which makes it run perfectly reliably backwards from 5:00 pm to 4:00 pm. As we said, this is because the truth-adherence of your belief that it is 4:30 pm in *Normal Clock* resides in the fact that you would still have that belief in slightly changed circumstances in which the mechanism of the clock continues to work perfectly reliably. Likewise, the worlds close to the actual circumstances of *Stopped Clock* surely include those in which the mechanism of the clock is stopped.²⁹

What is essential to our counterexample then, is that the behaviour of the mechanism gets fixed across close possible worlds. Anything else, including the intentions of its designers, is simply irrelevant. In fact we introduced the story of the cult into the example to ensure that the behaviour of its mechanism gets fixed across close possible worlds, but other stories could be told. Perhaps the cult intended to symbolise the cursed nature of the hour with a seemingly unnatural phenomenon. Indeed we could dispense with the cult entirely and stipulate that a bug in the programming of the microchip circuit of your clock causes it run perfectly reliably backwards from 5:00 pm to 4:00 pm during a particular hour.

4. Luck as Accident

We claimed that as in *Stopped Clock*, you do not know that it is 4:30 pm in *Backward Clock* because in both cases, your belief that it is 4:30 pm is luckily true. In both cases you were lucky to look at the position of the hands of your clock at the only instant during the hour when you nap at which they could have pointed

²⁷Adams, Barker and Clarke, "Beat the Clock," 358.

²⁸Adams, Barker and Clarke, "Beat the Clock," 357-358.

²⁹Williams and Sinhababu, "The Backward Clock," 49.

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... there is luck/accident in the link from the actual time to the clock's displaying 4:30, and there is luck/accident in the link from the clock's displaying 4:30 to the subject's belief. Hence, the reason the subject lacks knowledge is that neither the clock nor his belief is tracking the truth. His belief is that it is 4:30, and it happens to be 4:30. But it is not the case that he believes it is 4:30 *because* it is 4:30 – his believing it to be 4:30 is not explained by the fact that it is 4:30.³¹

I do not see why we should prefer 'accidentally true belief' over 'luckily true belief'. The latter locution is more apposite because there is good and bad luck, and given that true beliefs are good, it is good luck in both *Stopped Clock* and *Backward Clock* that you end up with a true belief. Nonetheless let us talk of 'accident' as Adams, Barker and Clarke do. As we just saw in the last section, they take this as a synonym of 'coincidence,' in other words its being the case that two events or states of affairs happen to occur or obtain together, but without either causing the other. In both *Stopped Clock* and *Backward Clock* it is a coincidence that the time to which its hands point – 4:30 pm – is the time at which you look at them. Neither causes the other. But against Adams, Barker and Clarke, it is no coincidence that you acquire the belief that it is 4:30 pm when you look at its hands pointing to 4:30 pm. Your observation of the position of its hands, itself determined by their actual position, together with your understanding of how such positions represent time and your knowledge that your clock has always worked perfectly reliably, is what *makes you believe* that it is 4:30 pm.

Now they immediately conclude that

So the method (or reason) that gives rise to the subject's belief is not a truth-tracking method (or reason), for it is too equivocal to yield knowledge.³²

Let us postpone the question of what a truth-tracking method – as opposed to a truth-tracking belief – might be, until section 6. There remains their claim that your method of ascertaining the time you wake is 'equivocal.' What does this mean? In all three cases your method of ascertaining the time during the hour you nap is to look at your clock, or to put this more accurately, to observe the position of its hands. How is this 'equivocal' in *Backward Clock*? Their answer is that

³⁰Adams, Barker and Clarke, "Beat the Clock," 357.

³¹Adams, Barker and Clarke, "Beat the Clock," 359.

³²Adams, Barker and Clarke, "Beat the Clock," 359.

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... the clock's face emits false testimony for 59 minutes during that hour from 4:00 to 5:00. There is no way one could tell from this equivocal messenger which clock display (if any) expresses a truth rather than a falsity.³³

To avoid the metaphor 'testimony,' this says that its hands point to the correct time only once during the hour that you nap. This is true. It is also true that you cannot tell, *just by observing the position of the hands*, when these point to the correct time. To know that, you would have to use an independent check of the accuracy of the clock, such as another clock that you know is accurate. But this is equally true of *Normal Clock*. So if *Backward Clock* is equivocal then so is *Normal Clock*, and if this is an impediment to knowledge then you can't know that it is 4:30 pm in *Normal Clock*. But you can.

In any case, even if Adams, Barker and Clarke have succeeded in showing that you do not know that it is 4:30 pm in *Backward Clock*, all the better for our counterexample against Nozick's analysis, since (1)-(4), and in particular (3), remain true.

5. How Dretske's Early Analysis Gets Clocked Out as Well

Early in their reply, Adams, Barker and Clarke say that

... your method of forming your belief is the procedure you use to acquire your reason for believing, and your reason affords you knowledge only if it is sensitive to the truth – it wouldn't obtain unless your belief were true.³⁴

This appears to espouse what we might call *Dretske's early analysis* of knowledge, that

S knows that *p* just in case

- (1) *S* believes that *p* (without doubt, reservation or question) on the basis of *R*.
- (2) *R* would not be the case unless *p* were the case.
- (3) Either *S* knows that *R*, or *R* is some experiential state of *S*.³⁵

Here *R* is a reason that *S* has for believing that *p*. We nowhere talked of a reason. We did however argue that *Backward Clock* shows that replacing Nozick's sensitivity condition (3) with various formulations of the safety condition on knowledge – roughly that *S*'s belief could not easily be false – still predicts

³³Adams, Barker and Clarke, "Beat the Clock," 358.

³⁴Adams, Barker and Clarke, "Beat the Clock," 354.

³⁵Fred Dretske, "Conclusive Reasons," *Australasian Journal of Philosophy* 49, 1 (1971): 12–13.

There's Nothing to Beat a Backward Clock: A Rejoinder to Adams, Barker and Clarke knowledge where there is ignorance.³⁶ There we argued that in using any of the clocks, if you know that it is 4:30 pm on a 'basis,' then this must be that the hands point to 4:30 pm. Let us call this a 'reason.' Now let us modify *Backward Clock* slightly. We may suppose that as you observe the position of its hands, you believe that it is 4:30 pm without doubt, reservation or question, because you know that your clock has always worked perfectly reliably. You base that belief upon your conjunctive reason that the hands point to 4:30 pm and your clock has always worked perfectly reliably. But this conjunction would not be true unless it were 4:30 pm, because the hands would not point to 4:30 pm unless it were 4:30 pm. This is because the circumstances in which you find yourself include those in which the clock runs perfectly reliably backwards from 5:00 pm to 4:00 pm. Finally, we may stipulate that you know the conjunction that the hands point to 4:30 pm and your clock has always worked perfectly reliably. (1)-(3) are all true, but you do not know that it is 4:30 pm any more than you know this in *Stopped Clock*. So Dretske's early analysis is also too weak, predicting knowledge where there is ignorance.³⁷

6. What Are Truth-tracking Methods?

We have already noted that Adams, Barker and Clarke talk of truth-tracking methods, insisting that your method of ascertaining the time you wake is not truth-tracking. They also talk of sensitive methods.³⁸ However it is difficult to see how recourse to methods will block *Backward Clock*. The method you use to ascertain the time you wake is the same in all three case, namely to observe the

³⁶Williams and Sinhababu, "The Backward Clock," 52–55.

³⁷Tamar Lando, "Conclusive Reasons and Epistemic Luck," *Australasian Journal of Philosophy* 94, 2 (2015): 378–395, gives other counterexamples to this analysis. Dretske has a *later analysis*, that *K* knows that *s* is *F* just in case *K*'s true belief that *s* is *F* is caused (or causally sustained) by the information that *s* is *F* that is carried by a signal *r*, where *r* carries the information that *s* is *F* just in case the conditional probability of *s*'s being *F*, given *r* and *K*'s background knowledge is 1, but less than 1 given *K*'s background knowledge alone. See Fred Dretske, *Knowledge and the Flow of Information* (Cambridge, M.A.: MIT/Bradford, 1981), 86. *Normal Clock* seems to refute this. Your true belief that the time is 4:30 pm is supposed to be caused by the information that the time is 4:30 pm that is carried by the signal of the positions of the hands of your clock. But the conditional probability of the time being 4:30 pm, given these positions plus your background knowledge only that the clock has always worked perfectly reliably, is less than one. You cannot exclude the possibility that on this occasion the clock is not working reliably. Yet you know that it is 4:30 pm. Thus Dretske's later analysis is too strong, predicting ignorance where there is knowledge.

³⁸ For example, "This method is sensitive to the truth, for the clock wouldn't say what it says if the correct time weren't 4:30 p.m." (Adams, Barker and Clarke, "Beat the Clock," 355.)

position of the hands of your clock during the hour that you nap.³⁹ Since this method provides you with knowledge in *Normal Clock*, how can it deprive you of it in *Backward Clock*? Perhaps Adams, Barker and Clarke will reply that the method is sensitive in *Normal Clock* but not in *Backward Clock*. But they don't tell us what a sensitive method amounts to, at least not in a way that distinguishes it from a sensitive belief formed via a method. They say that

Knowledge may be obtained, on tracking theories of knowledge, when p is true, one believes that p on the basis of a reason R or method M, and one's reason R (Dretske) or *method M* (Nozick) is *sensitive* to the truth – i.e. if p were not true one would not believe that p via R or M.⁴⁰

This formulates a sensitive method as one that produces a sensitive belief, namely a belief that one wouldn't have were its content false. This doesn't help them, because the method you use in *Backward Clock*, namely observing the positions of its hands during the hour you nap, *does* produce a sensitive belief when you use it at 4:30 pm. Adams, Barker and Clarke need to make sensitive methods come apart from sensitive beliefs and then show that although your belief is sensitive, it is not produced by a sensitive method. Then they can go on to use this result to defend an analysis of knowledge that they seem to have in mind, in terms of sensitive, and presumably, truth-adherent methods. This *ABC analysis* (Adams, Barker and Clarke) would be as follows.

³⁹Moreover this is how you would describe your method, which seems like a fair default way to decide what it really is (See John N. Williams, "Propositional Knowledge and Know-How," *Synthese* 165, 1 (2008): 122). We thought that this was clear in "Backward Clock" since we described the method identically in all three clock examples. In each case we started with "You habitually nap between 4 pm and 5 pm. Your method of ascertaining the time you wake is to look at your clock..." It seems pretty clear from this that your method of ascertaining the time you wake is to observe, *during the period from 4:00 pm to 5:00 pm* (since that is the period during which you nap, not knowing when you will wake) the position of its hands. I am therefore surprised that Adams, Barker and Clarke countenance us as claiming that your method is 'looking at the clock at 4:30' (Adams, Barker and Clarke, "Beat the Clock," 360). Of course you wouldn't describe your method as this but as 'looking at the clock during the hour that I nap,' as they note (Adams, Barker and Clarke, "Beat the Clock," 360). They even claim that we described the method this way when Adams presented his reply in a talk in March 2016 (Adams, Barker and Clarke, "Beat the Clock," 360, note 14). We don't remember it that way. I suspect that they may have confused the claim they falsely attribute to us with our correct point that when you use your method of ascertaining what time you wake by observing the position of the hands *during the hour that you nap*, but *use it at 4:30 pm* then, in *Backward Clock*, you acquire a sensitive belief.

⁴⁰Adams, Barker and Clarke, "Beat the Clock," 354, my italics.

There's Nothing to Beat a Backward Clock: A Rejoinder to Adams, Barker and Clarke

S knows that p , using method M of arriving at a belief whether p , just in case

- (1) p
- (2) S believes, using M , that p .
- (3) M is a sensitive method.
- (4) M is a truth-adherent method.

Since Adams, Barker and Clarke have no quarrel with the truth-adherence of your belief in *Backward Clock*, let us grant them (4) and concentrate on (3). What might a sensitive method be? Presumably it will have some connection with sensitive beliefs.⁴¹As just shown, they cannot say that a sensitive method is one that sometimes produces a sensitive belief. The alternative options are that it mostly or always produces sensitive beliefs. But now consider a fourth clock, one that combines *Normal Clock* with *Stopped Clock*. This is *Recently Stopped Clock*, as follows.

You habitually nap between 4 pm and 5 pm. Your method of ascertaining the time you wake is to look at your clock, one you know has always worked perfectly reliably. This clock is analogue so its hands sweep its face continuously. However, it has no second hand. Awaking at 4:55 pm, you see that its hands point to 4:55 pm. Accordingly, you form the belief that it is 4:55 pm. And it is indeed 4:55 pm because the clock has continued to work perfectly reliably until 4:50 pm, when a bug in the programming of its microchip circuit caused its hands to jump to 4:55 pm and then stop.

⁴¹Abandoning the connection looks unpromising. They cannot say that a sensitive method is *simply* one that always or mostly results in true beliefs. That would be to abandon truth-tracking altogether in favour of reliabilism, with its attendant difficulties, including the generality problem as raised by Earl Conee and Richard Feldman, "The Generality Problem for Reliabilism," *Philosophical Studies* 89, 1 (1998): 1–29. They can however claim that there is a *connection* between a sensitive method, whatever that will turn out to be, and a reliable one. In an exchange originating from Tristan Haze's apparent counterexamples to Nozick's analysis ("Two New Counterexamples to the Tracking Theory of Knowledge," *Logos & Episteme. An International Journal of Epistemology* VI, 3 (2015): 309–311), Haze reads Fred Adams and Murray Clarke ("Two Non-Counterexamples to Tracking Theories of Knowledge," *Logos & Episteme. An International Journal of Epistemology* VII, 1 (2016), 67–73) as saying that S knows that p via M just in case for all q , S believes that q via M just in case q (Haze, "Reply to Adams and Clarke," 225). I don't read them that way. This sees them as saying *inter alia*, that you know via a method only if that method allows you to *believe all truths*. Clearly that's far too strong. Adams and Clarke say that both Nozick's and Dretske's early analysis involve a method or a reason that is completely reliable (Adams and Clarke, "Two Non-Counterexamples," 71). So perhaps they think that a truth-tracking method, whatever that turns out to be, always produces true beliefs.

Most of the beliefs that you might form by observing the positions of the hands of your clock during the hour that you nap are sensitive. These are those that you would form during the period from 4:00 pm to 4:50 pm when it functions as *Normal Clock*.⁴² So if a sensitive method is one that produces mostly sensitive beliefs, then the method that produces your belief that it is 4:55 pm is a sensitive method. Assuming that this method is also truth-adherent, the ABC analysis predicts that you know that it is 4:55 pm. But you don't, any more than you know that it is 4:30 pm in *Stopped Clock*. In both cases your belief is luckily true. You were lucky to look at your clock at 4:55 pm, at the only instant during the period from 4:50 pm to 5:00 pm at which its hands could have pointed to the correct time.

Now suppose that the clock's mechanism behaves in exactly the same way, but that waking at 4:30 pm, you see that its hands point to 4:30 pm. Accordingly, you form the true belief that it is 4:30 pm. Surely you know that it is 4:30 pm, because that is what you know in *Normal Clock* – which from 4:00 pm to 4:50 pm is essentially the same as your clock. But not all of the beliefs that you might form by observing the positions of the hands of your clock during the hour that you nap are sensitive. At 4:55 pm you might form the belief that it is 4:55 pm. That is an insensitive belief, because had you looked at your clock at 4:56 pm, then you would still believe that it is 4:55 pm. So if a sensitive method is one that always produces sensitive beliefs, then the method that produces your belief that it is 4:30 pm is an insensitive method. So (3) of the ABC analysis is false, with the result that it is now too strong, predicting ignorance where there is knowledge.

7. Concluding Remarks

Backward Clock shows that despite the arguments of Adams, Barker and Clarke, Nozick's analysis – as well as Dretske's early analysis – is too weak, predicting knowledge where there is ignorance. An analysis in terms of truth-tracking methods rather than truth-tracking beliefs is no remedy. One important conclusion that might be drawn from this discussion is that combining sensitivity conditions with truth-adherence conditions isn't enough to exclude epistemic luck.

⁴² All of these beliefs are also true. This suggests that if a sensitive method is one that mostly produces sensitive beliefs, then a sensitive method mostly produces true beliefs. This however holds uninterestingly. A belief is sensitive just in case if *counterfactually false*, one wouldn't have it, so all sensitive beliefs are by definition true.