Twitter Thread by Simon DeDeo

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On Bayesianism, the Many Worlds Interpretation, and personal identity.

Some thoughts worked out in a letter to a friend, which is the kind of thing you do when off Twitter for a glorious week. (■)

“Chance is ignorance”—the Bayesian story; all probabilities represent states of mind, not states of the world. One *could* put (some) chances “in the world”, but let’s take Occam’s Razor seriously...

That the probability of a fair coin coming up heads is 50% simply means that marginalizing (tracing, as the physicists say) over the hidden facts leaves you, nearly, maximally ignorant of the outcome.

Quantum uncertainty (access below!) poses an apparent challenge to this story. There seems to be nothing to be ignorant about when it comes to (say) electron spin—there is nothing “inside” the object.
https://t.co/DhHmN0ndjx

The electron is a simple object, in other words. So where does the uncertainty come from? One could follow David Wallace’s wonderful interpretation in terms of chaotic dynamics and decoherence, but let’s see if we can take another route...

It lies, finally, not in our lack of knowledge of what’s inside the electron (there is nothing there), but rather a lack of self-knowledge—we do not know which branch of the Universe we ended up in!

We lack knowledge, in other words, of the referent of a pronoun—which “I” I am. If you’re Saul Kripke, the rigid designator has detached—you must be re-baptized. For that reason, we should naturally refer to MWI as Born Again Quantum Theory (with the obvious pun).

The world is constantly forking, of course, but the vast majority of those forks are completely meaningless to us; they fall, for all intents and purposes, into the same equivalence class.

It’s only in rare cases (like those electrons at ANU) that we come directly into contact with these forks, where the equivalence class splits. Most classical uncertainty is simply further refining knowledge about the initial quantum state.

(I won’t tell you how my ANU quantum coin came up—ha ha! I know which branch we’re on, you don’t, but that’s just a classical, Bayesian matter.)

This is probably super-obvious to someone like @seanmcarroll, but there are two nice things about it.

First, it’s a nice way to get at the MWI from an unexpected direction. You don’t have to know about the Schrödinger Equation, decoherence, etc to realize the Universe *must* split.

That might help (depending on your philosophy of science) increase your confidence in the underlying metaphysical claims.

Second, it helps me understand why The Universe Splitter is a non-trivial device. It really does split universes... https://t.co/Uar00s1zmN

And it’s kind of cool to realize that it wasn’t until we learned to isolate and pay attention to quantum effects that the universes began to split!

Definitely a (classical) fact of the matter! The radioactive decay couples very quickly to the classical world—which means you’ve already split before you have time to wonder about his state. https://t.co/ffFcngLV3a

> Is there a fact of the matter as to whether the cat is alive before you open the box?
>
> I would say not, and all your references to how the world "is" are similarly incoherent.
>
> — Avraham Eisenberg (@avi_eisen) November 8, 2020

In any case, nearly all the forks that matter in human history happened long ago (at inflation, or perhaps reheating). I think. Can anyone think of a pre-twentieth century coupling to novel quantum uncertainty?

Most quantum effects are invisible to us—meaning that our ignorance of which universe we’re in is permanent, and therefore irrelevant. Perhaps when it comes to single-photon events—@DavidDeutschOxf’s frog in _Fabric of Reality_...

But did any decision, or memory, ever hang on the outcome on how a single photon interfered with itself? (Until today, when we basically, being humans, do it for the lulz!)

I’m a little worried I’m missing some massively obvious quantum influence, but one point in my favor is that this kind of world-splitting re-baptism took so long to discover. It’s not obvious at all.

And technically, we couldn’t know about it until Bell’s Inequality proved that there were no (relevant) hidden gears within the electron.

YES! I think this is meaningful. https://t.co/bKiU3y0cAX

> Wait so you disagree with 'quantum splitting means that that there are futures where you become the next US president and futures where you murder your family and futures where you spontaneously combust' takes?
>
> — Peli Grietzer (@peligrietzer) November 8, 2020

It's (nearly) all classical uncertainty. Those worlds exist, but are separated by a vast gulf—they split billions of years ago, well before any decision we might make.

Until someone uses the ANU device to hang some history on. There's even a kind of odd utilitarian morality to it—if you are thinking about doing something bad, and hang it off ANU, you reduce the harm by a factor of two.

Nearly all personal identity splits happened (literal) eons ago. Laplace's demon—we're just discovering the consequences of the (decohered) initial conditions. https://t.co/pXX0YHIVJy

> Can you defend this distinction between past and future splits?
>
> You mentioned personal identity, are you going to argue that personal identity splits even if we're unaware of any differences?
>
> — Avraham Eisenberg (@avi_eisen) November 8, 2020

Those Universes separated so long ago that there's no real sense in which Classical Simon1 and Classical Simon2 are comparable. You might as well line me up with Alpha Centauri Simon.

Nothing actually forks it. We're emergent phenomena, our experiences equivalence classes over quantum states. ANU just happens (for the lulz) to split them, which I'm suggesting is actually super-rare in human history. https://t.co/hJ47tyaGIN

> My issue is what forks \u201cspace\u201d itself? Obv we need a QG theory, but MWI assumes some background independence or metaphysical substrate in which alternative quantum states can resolve.
>
> — U.S.O.U.S. (@hyperauxetic) November 8, 2020

Definitely. My lamp tips over. That informs me about a sequence of classical events that goes back to the formation of the Earth, and much further. Now I know which path the atoms took after initial decoherence, but that was my ignorance. https://t.co/ig89rZCbcQ

> You think there's a fact of the matter about whether you are Classical Simon1 or Classical Simon2? My instinct is that there isn't, if they are qualitatively identical to each other
>
> — Peli Grietzer (@peligrietzer) November 8, 2020

Kripke semantics would say that a copy of the standard meter doesn't have to "know" it's not the standard meter for it to be distinct. https://t.co/Y6EzUTtgtP

> If both have the exact same memories and you can't tell which one "you" are, then from your perspective there shouldn't be a fact of the matter as to which one you are. At least, that's my view on personal identity. What's the argument against?
>
> — Avraham Eisenberg (@avi_eisen) November 8, 2020

This also helps me understand all those bits that ANU gathers but never serves to users. They (eventually) vanish (deleted for space), leaving no trace. Nobody will ever know how they turned out, and so our equivalence class can’t split.

Just realized that one source of universe-splitting started happening with (I think) cosmic ray errors in silicon. Where, in particular, the ray interacts is a quantum effect—causing one error over another, becoming visible to the operator.

You have to buy the Kripke story about how pronouns work. I, personally, think it’s intuitive and how I use them—but you may not! https://t.co/w5kHRVIc4K

> Not sure how that's relevant to personal identity.
>
> — Avraham Eisenberg (@avi_eisen) November 8, 2020

I don’t know! I have Meillassoux on my desk (_After Finitude_) and would love any suggestions. https://t.co/JyY1yQsmzF

> Simon, I don't mean to distract you from your brilliant thread, here, but what would you say to a Meillassouxian-type committed to an arche-fossil as the basis of absolute contingency?
>
> — NAF Loves Meillassoux (@LovesNaf) November 8, 2020

Oh, I think this works, yes. Sad, but true. Any happier examples? (Although in another sense, Max’s example *is* happy—there are yous that survive.) https://t.co/hErcyUtJ66

> Not sure this is what you\u2019re looking for, but Tegmark uses cosmic rays causing cancerous mutations as one example of quantum splitting have observable macro effects.
>
> — Matt Clancy (@mattsclancy) November 8, 2020