Comments for: *Credal Omniscience and Relevance Confirmation*

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The Argument

P1. Rational agents [can | must] be subjectively certain of some indexicals.

P2. Rational agents update (only) by conditioning on evidence.

Ccl. Rational agents cannot dislodge certainty in indexicals. Contradiction.

Example: Higher-order credence

Suppose $P_t(E) = 1/2$.

By OCO, $P_t(P_{now}(E) = 1/2) = 1$.

Suppose $P_{t+1}(\bullet) = P_t(\bullet \mid E)$.

Then $P_{t+1}(P_{now}(E) = 1/2) = 1$, which is absurd.

Example: Clock-watcher

Agent is subjectively certain that it is 5PM *now.*

Agent conditions on accurate clock observation at 5:01PM.

Agent is *still* subjectively certain that it is 5PM *now*.

The Argument:

"The problem, in essence, is that … it is impossible for an ideally rational agent to have her total set of certainties expand monotonically. Considered at two distinct times, she must have at each time … certainties which … contradict her certainties at the other time." (p. 8)

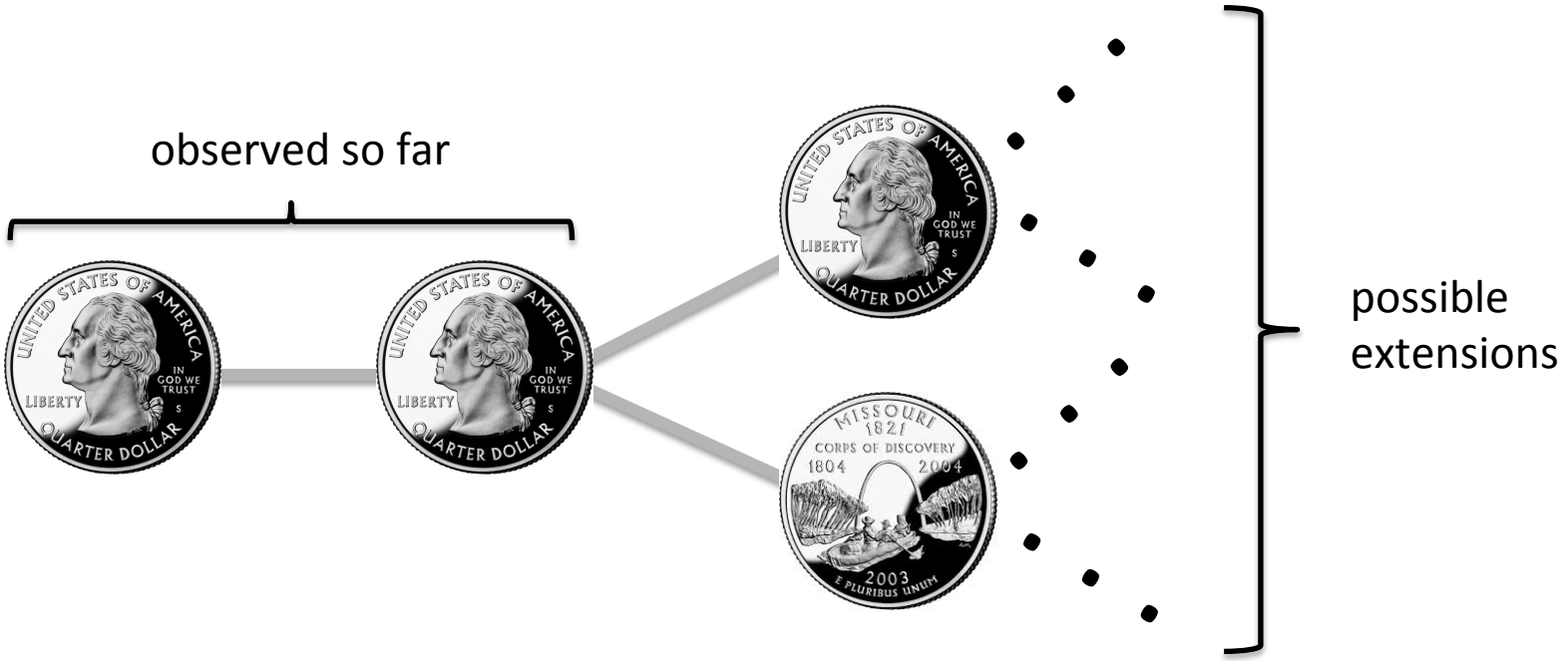
Question:

How pervasive is that problem? And why doesn't it arise in standard settings?

Example: Sequential Binary Experiment

Worlds = infinite sequences of coin flips.

Evidential states = cones of possible extensions of finite sequences:



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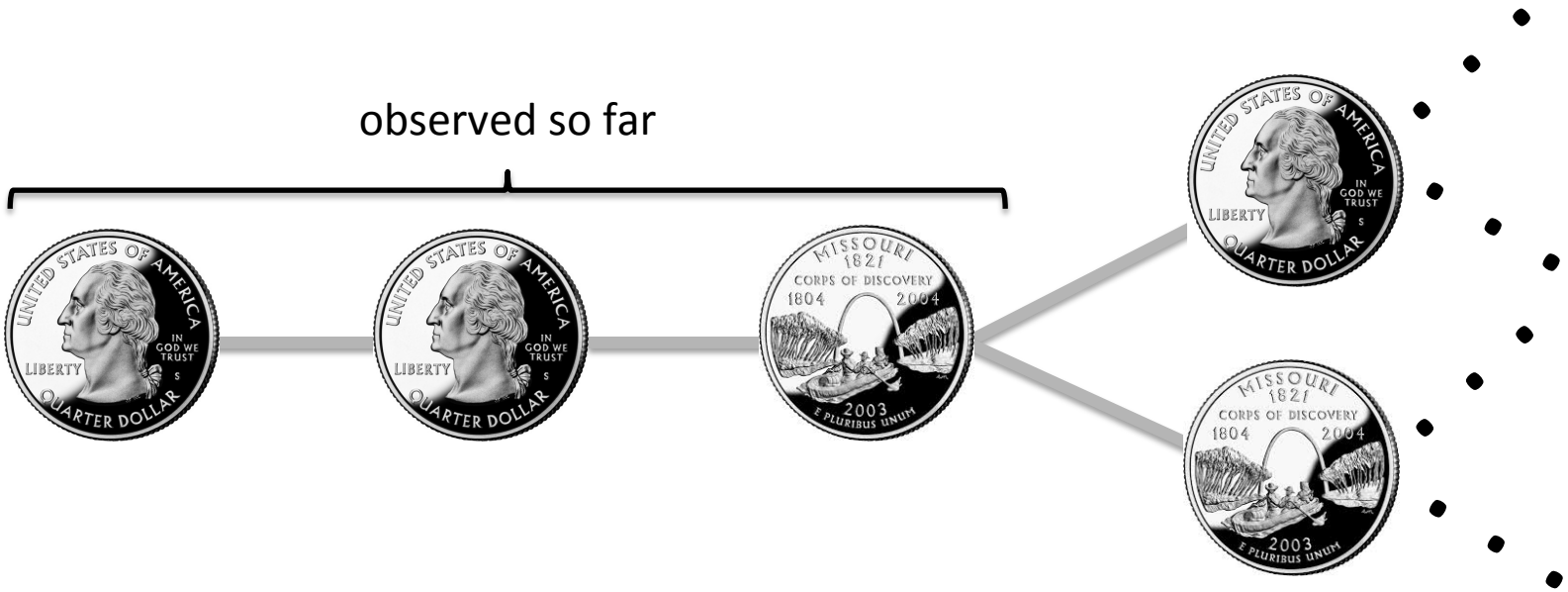
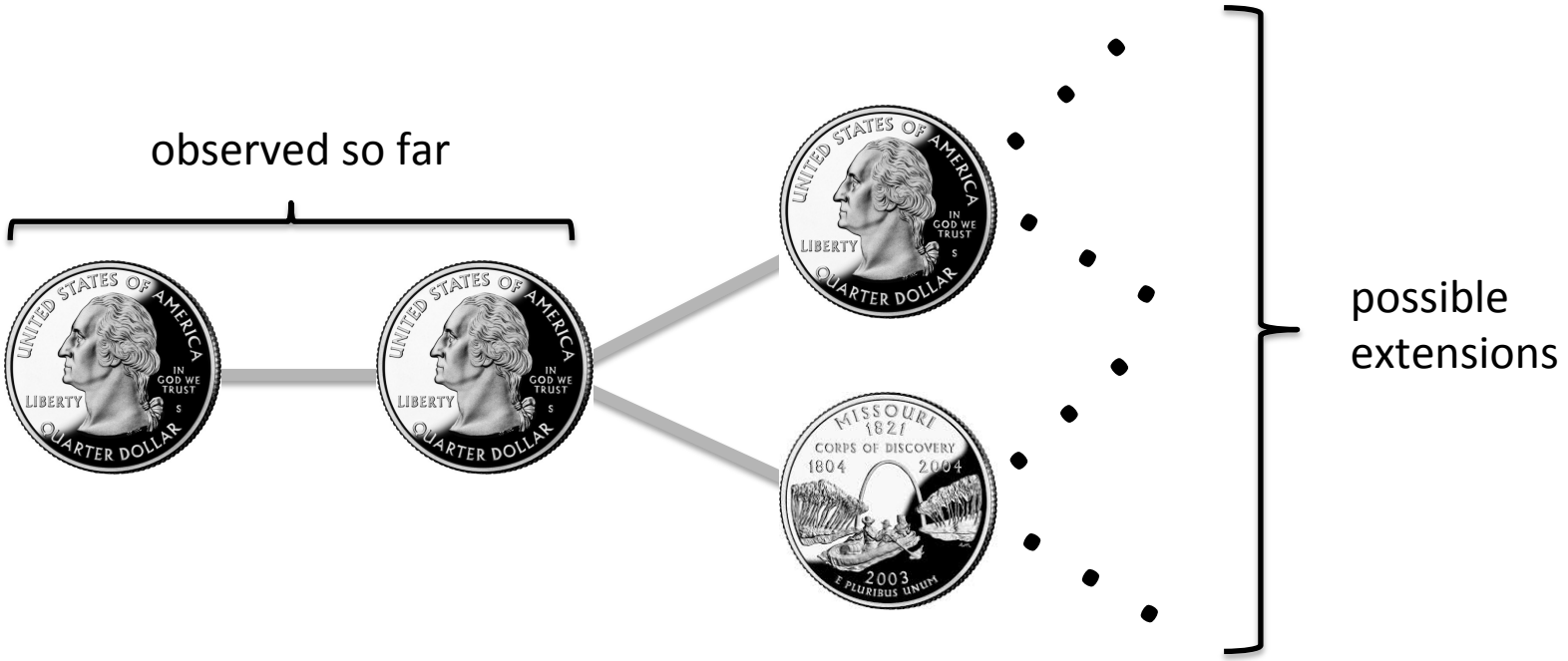


Example: Sequential Binary Experiment

The agent is certain that she has now seen exactly 2 flips.



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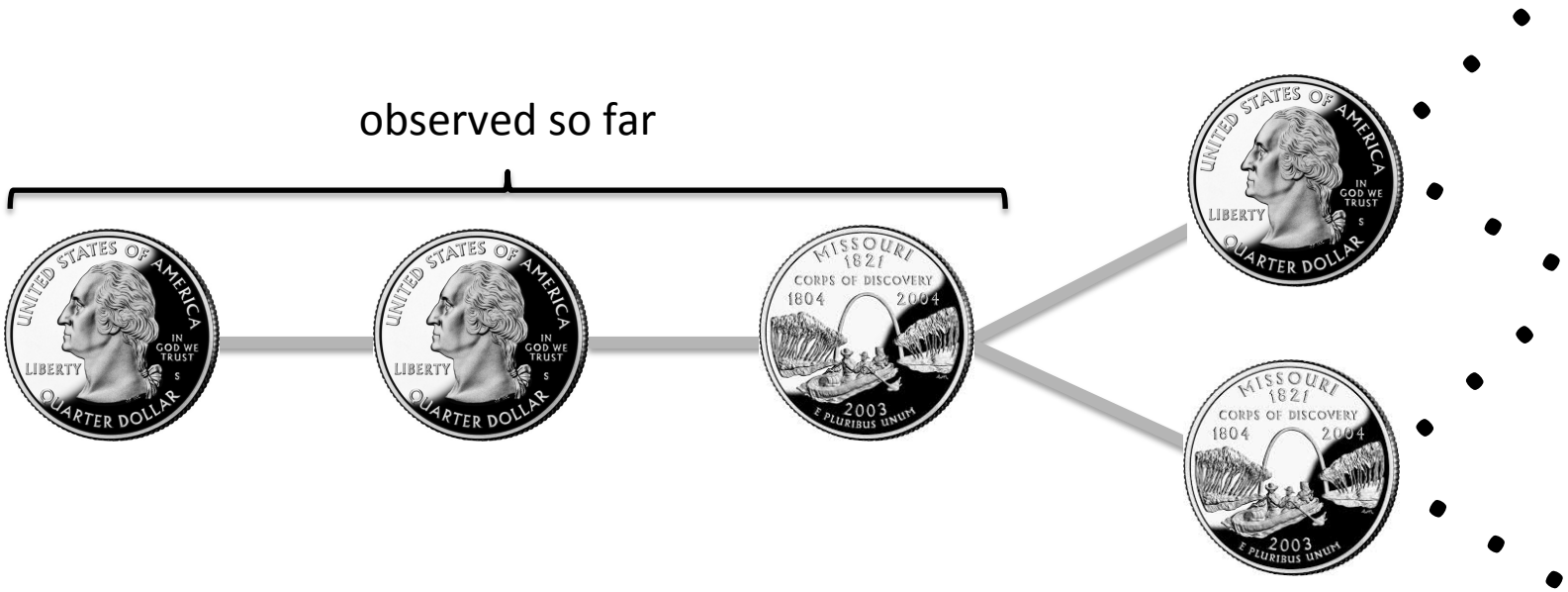
The agent is certain that she has now seen exactly 3 flips.



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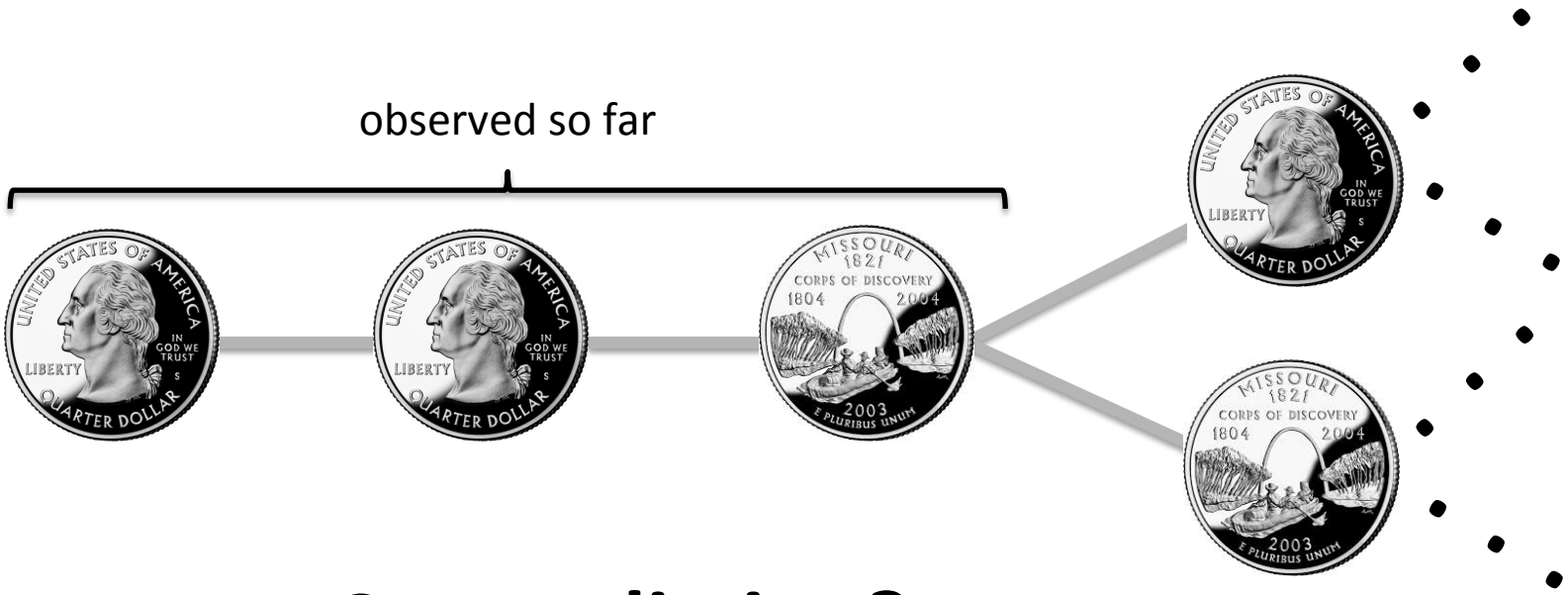
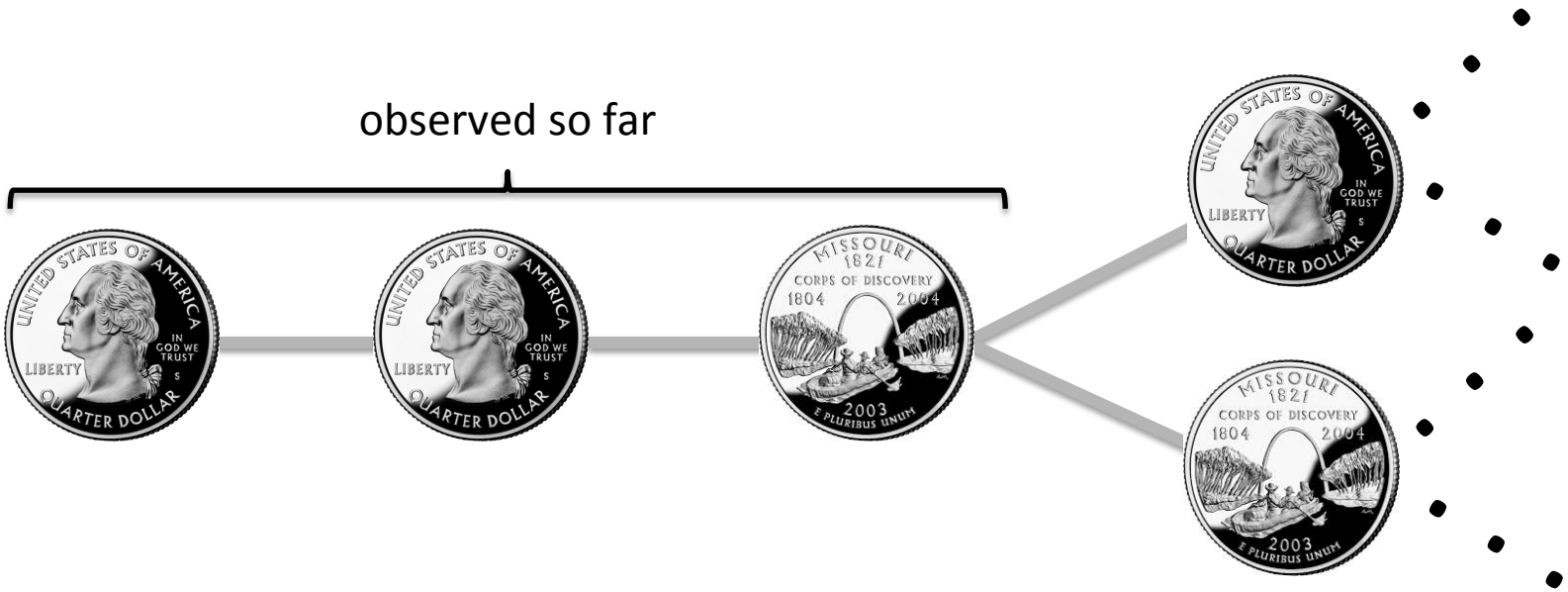


Contradiction?

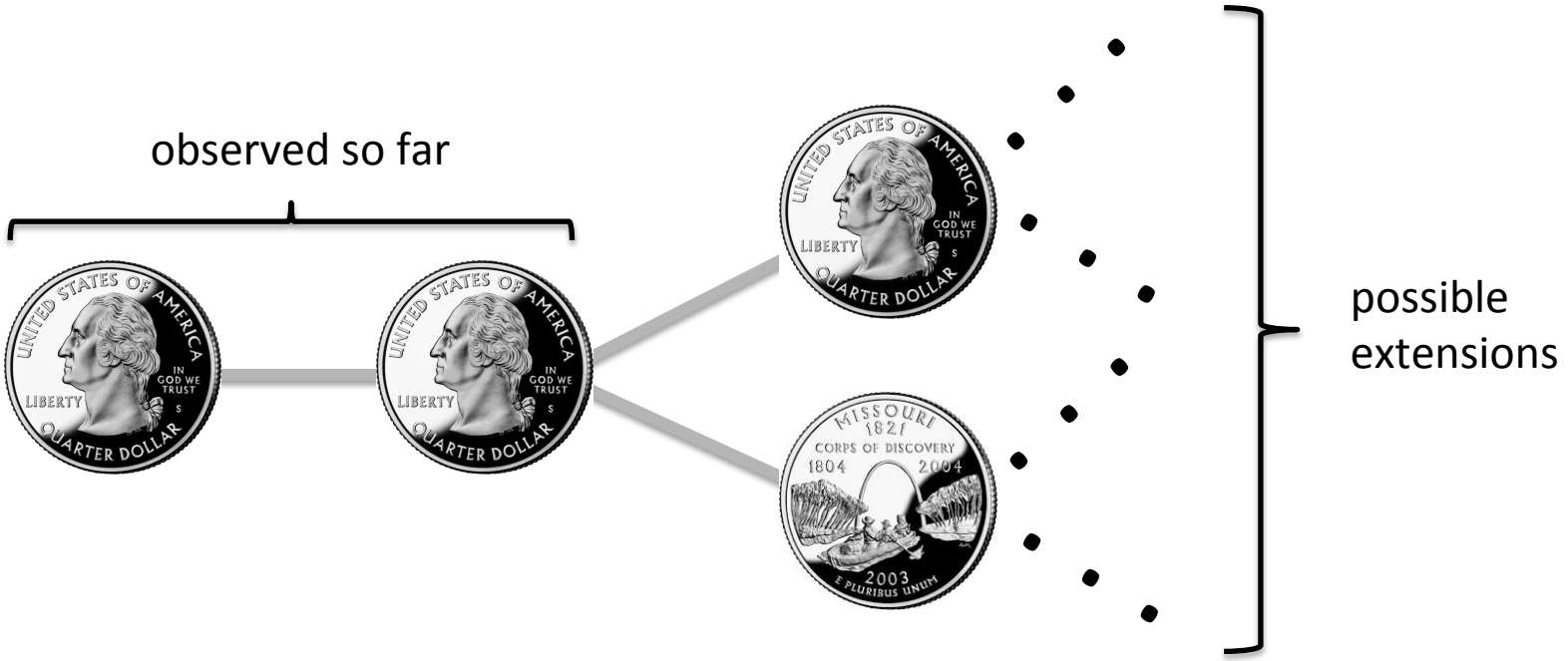
Example: Sequential Binary Experiment

There is no *proposition* in the algebra corresponding to 'exactly 3 flips have occurred'.



Example: Sequential Binary Experiment

The agent is certain that *HH* is an initial segment of the world.



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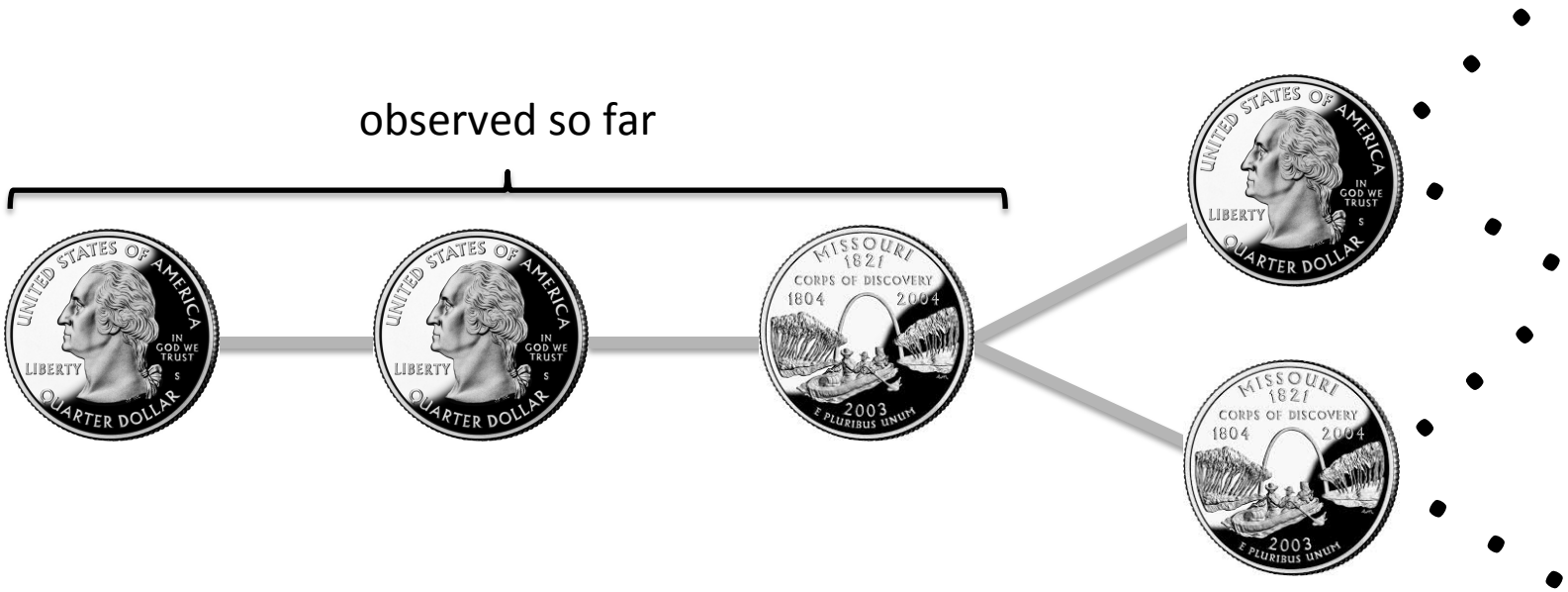

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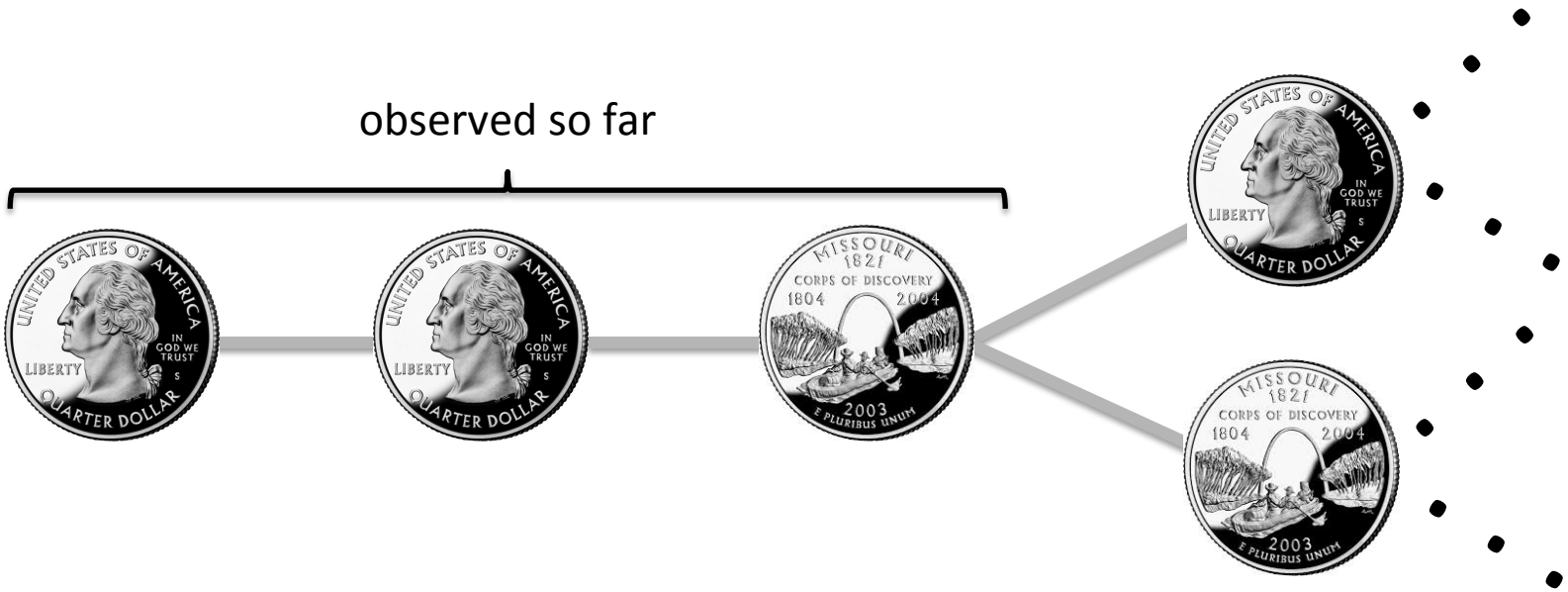
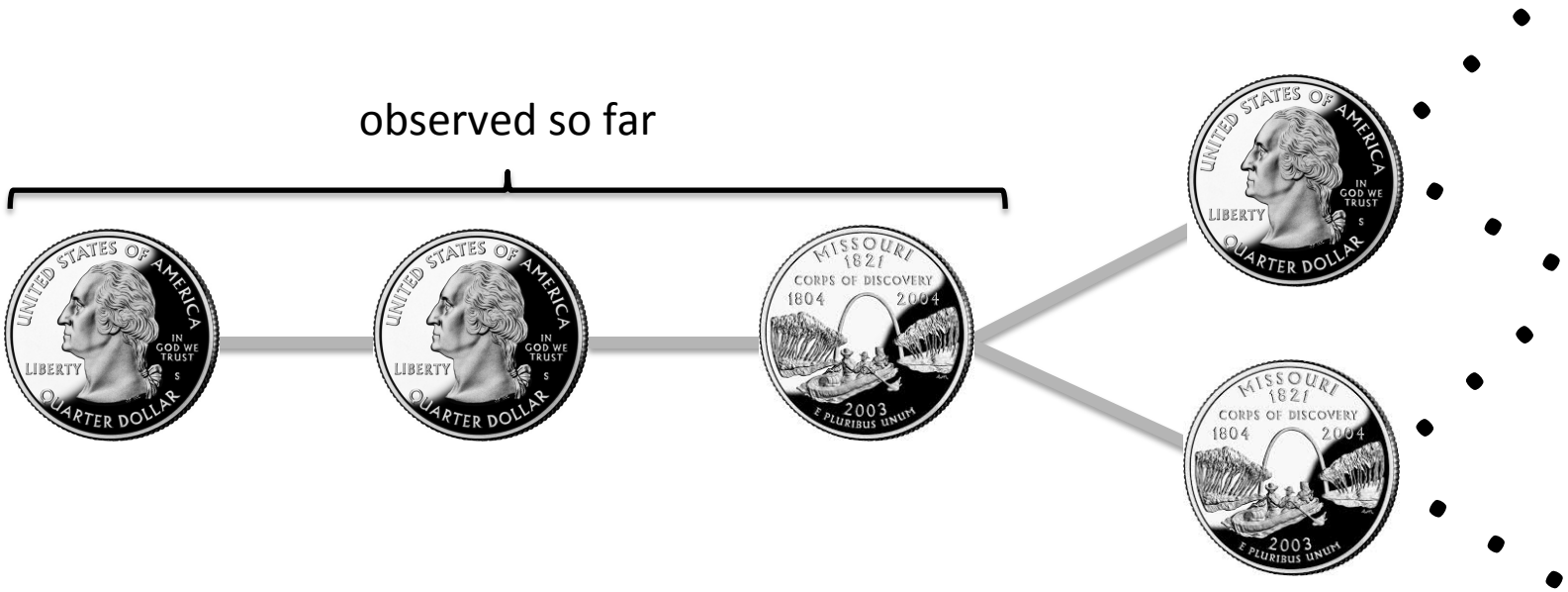


No Contradiction.

Example: Sequential Binary Experiment

But we can "read off" the exact number of flips from the amount of evidence we have seen.[1]



1. It will make sense to talk about "amount of evidence" in any sample space equipped with a metric.

The Meeting

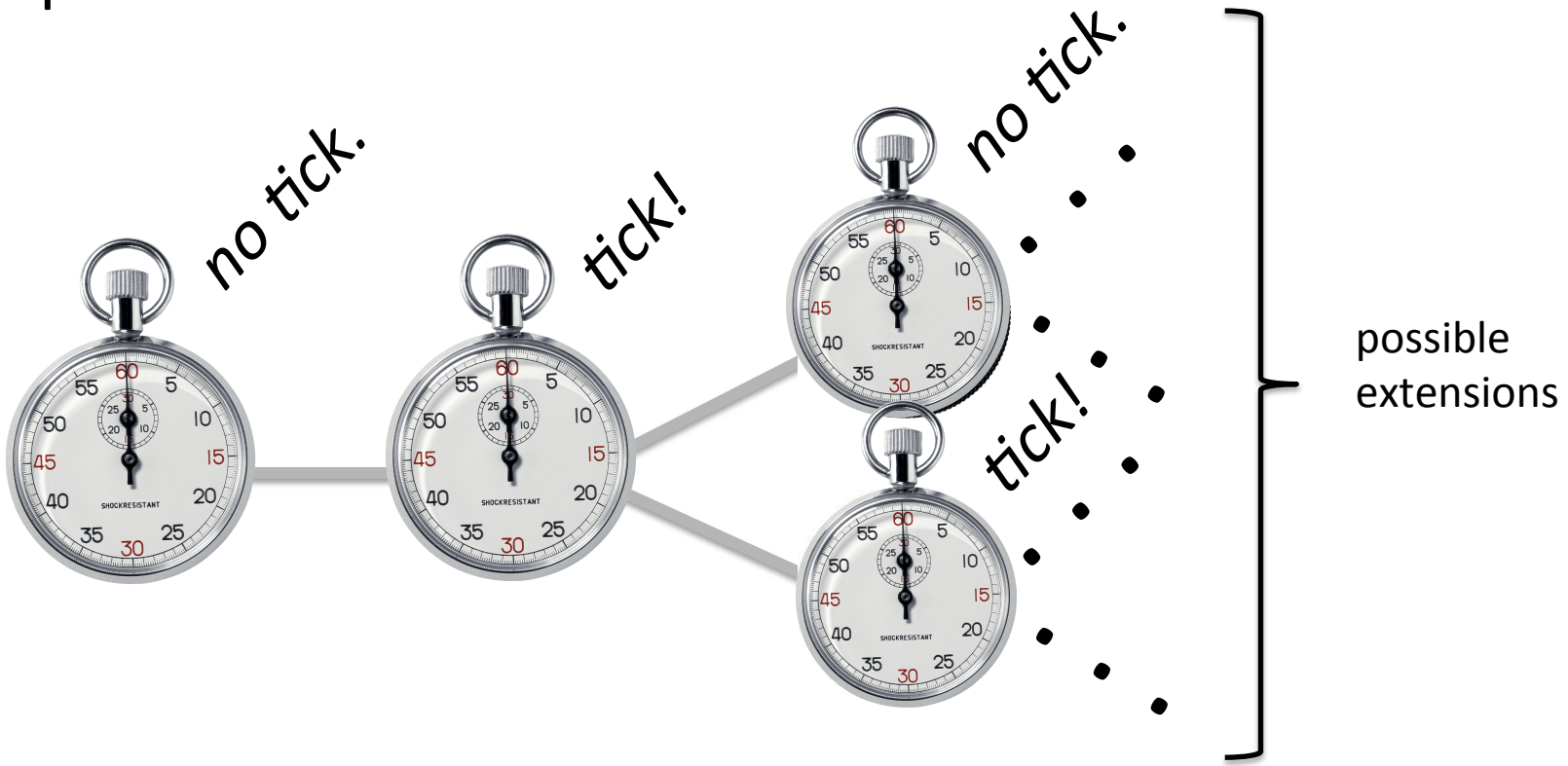
- [A] professor, who desires to attend the department meeting at noon, sits motionless in his office at that time. Suddenly, he begins to move. What explains his action? A change in belief. He believed all along that the department meeting starts at noon; he came to believe . . . that the meeting starts *now*. (Perry, p. 4).

The Coffee Date

- Professors A and B meet at t and arrange to meet at the coffee stand in five minutes. Five minutes have passed, yet B sits motionless in his office. Suddenly, B begins to move. What explains his action? A change in belief. He believed all along that the coffee date starts five minutes from t; he came to believe that it is five minutes from t *now*.

Example: Sequential Binary Experiment

What if instead of coin flips we observe ticks of a stopwatch? Then we could "read off" clock time elapsed from the total evidence.



Example: Sequential Binary Experiment

Is there anything more to believing ‘exactly 3 clock seconds have elapsed’ than believing the evidential proposition [*tick, tick, tick*] and nothing stronger?

Example: Sequential Binary Experiment

Is there anything more to believing 'exactly 3 seconds have elapsed' than believing the evidential proposition [*tick, tick, tick*] and nothing stronger?

Is this kind of belief *essentially indexical* as well? If not, can we say which apparently indexical beliefs can be modeled propositionally, and which cannot?

The Argument:

"The problem, in essence, is that … it is impossible for an ideally rational agent to have her total set of certainties expand monotonically. Considered at two distinct times, she must have at each time … certainties which … contradict her certainties at the other time." (p. 8)

An Equivalent Argument?

"Put another way, no two possible sets of total knowledge which are such that one is a monotonic expansion of the other can be the evidence sets of any ideally rational agent. Just such a possibility, however, is what is required for an application of the positive relevance account as it requires comparing two possible bodies of knowledge such that one is a proper subset of the other. " (p. 8)

However:

knowledge != certainty != evidence

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Proposed Amendment

P_t(It is t+1 now) = 0.

P_{t+1}(It is t+1 now) = 1.

Naively conditioning on t+1 ticks does not raise the probability of ‘It is t+1 now’, however it is good evidence for ‘it is t+1 now’. Perhaps this is the desired counterexample to the relevance account.

Thank you!