In the fourth century before the common era, the philosopher Plato introduced a powerful image of prisoners who spent their entire lives in a cave - whose idea of reality was therefore constituted by their experience of nothing but shadows cast on the wall inside the underground den. How pitiable to have so limited a view of reality!

In Plato’s account, though, we’re told that these are “prisoners like us.” We moderns might scoff, thinking that - compared to 2,400 years ago - we are knowledge-rich!

But arguably, despite the availability of information, as a population, in some ways, we’re not too much better off than the cave-bound prisoners (Professor Markowski spoke aptly of “digital caves,” bringing the metaphor up to date): For one, the way we access information through a fragmented media - especially social media - creates an oh-so-convincing shadowplay on our the walls of our lives.

By signing up to “follow” certain pages and people on Facebook, Twitter, and other information channels, we ourselves - sometimes unwittingly - play a key role in helping to fine-tune the pre-filter on what information even makes its way into our view.

There is a lot we might say to deconstruct the biases that most plague and hinder us. But taking a cue from Rich Clark’s remarks during the last panel, I propose to look ever-so-briefly at the principles of inquiry by which our species has (arguably) been able most reliably to transcend its limits: I have in mind elements of the “logic of scientific inquiry.” I’ll argue that we can and ought to apply insights from science to our own processes of belief formation.

**Not Science**

One might think science makes progress by (1) observing the world without bias; then (2) coming up with guesses about how things work, why they happen - call it “generating hypotheses” (and - we might suppose - we do this based on only “the facts”); and finally we (3) confirm the hypotheses by means of experiment.

But this is arguably mistaken. I can make only a suggestive remark here about the first of these facets of this view of the logic of science progress; but I’ll dig into the third a little deeper.
(1) Against the assumption of what (in another context) has been called the *innocent eye*, there are important respects in which observation is “theory-laden”:

Perhaps what the *Washington Post* reported on January 25 of this year about Trump supporters’ alleged “observation” of *more* people at Trump’s inauguration than at Obama’s - “[e]ven when the photographic evidence [to the contrary] was directly in front of them” - is an instance of the phenomenon of the theory-ladenness of observation.

(2) Against the assumption that the “facts” themselves guide observers to the correct theory, the classic curve-fitting problem is an apropos metaphor.

Imagine if you will x and y axes, and a splattering of “data points.” Our task is to “construct the best-fit curve.” Note, in your mind’s eye: One might plot an infinite number of possible curves through that finite set of data points - many will miss at least some of the points; but outliers are normal. And once we’ve accepted a theory (whether it be that we know the best fit curve, or a story about who the good guys and bad guys are), the data points that don’t fit are too often chalked up to mistaken observation (or dismissed as “fake news”). So even if theory-laden observation weren’t an issue, knowledge would still face this “curve-fitting” challenge.

And notice how much leeway “observation” and “theorizing” leave for interpretation.

(3) Lastly, and most crucially, good experiments do *not* merely aim to confirm a hypothesis.

**What Confirmation Shows**

Carl Hempel, an influential philosopher of science, pointed out that a *favorable* outcome of a test does not prove a hypothesis to be true. If I believe “All swans are white,” and observe a white swan, what does that “confirmation” prove logically? The
answer you should be thinking is “Not much” - for one, it ignores the possibility of black swans! The fallacious reasoning that misconstrues the logical significance of such confirmatory observations is known to logicians as “affirming the consequent.”

- [It proceeds: “If all swans are white, then the swans we observe should be white. We do observe swans that are white. Therefore, all swans are white.”
- But this is the same reasoning structure by which one could conclude that this room is on fire: “If there’s fire here, then oxygen is present. There is oxygen present. Therefore, there’s fire here.” The observation of oxygen should obviously not be taken as proof of fire.]

The English psychologist Peter Wason - who coined the term “confirmation bias” - initiated a series of simple but ingenious experiments to flesh out the trap into which we fall again and again. In one, roughly, he told subjects that the sequence “2, 4, 6” conforms to a rule he had in mind; he challenged them to figure out what the rule was by experimentally proposing their own sequences, which he would tell them either conform to the rule, or not. People perform astonishingly poorly at this task.

Common strategies all reflect the temptation toward confirmation. Subjects proposed “positive instances” of their guesses, like counting up by twos, testing out triples like “4, 6, 8” and “10, 12, 14.” Yes, these happen to conform to Wason’s rule. And after scant confirmation of their guesses, subjects over-confidently claimed to have figured it out. But the actual rule was “numbers in increasing order of magnitude.”

Only the 20% who thought to attempt a falsifying experiment, proposing “4, 8, 6” or “1, 2, 3” - discovered the rule. It turns out that awareness of the logical relevance of falsification is not humanity’s psychological strength - though knowing that helps us compensate.

Falsification carries immensely more information: One falsifying observation sends theorists back to the drawing board, while one confirmation just adds more plausibility to the shadows on the wall. In seeking confirmation and overlooking falsification, we hinder our own efforts to transcend bias.

If I believe that the “liberal media” lies, and I’m confirmation-hungry and falsification-blind, I will seize upon any instance of falsehood in the news to confirm my belief that the media lie. If I am a climate change denier, I can claim the facts are obscured due to “the controversy” among experts - but only by giving special weight to diminishingly small confirmations of my view and ignoring powerful falsifications.

A final example. A meme floating by on Facebook caught my eye. It pictured a woman, and the caption read: “This is Mary Anne MacLeod - in 1929 she illegally immigrated to the U.S…. Mary is also the mother of Donald Trump!” I might have leapt to it, “Just as I thought!” After all, it confirms my conception of Trump as a hypocrite and so on. But a short Google search landed me
on the Snopes.com website, where I discovered that the claim remains unproven.

True self-overcoming in a “post-truth era” requires - for starters - guarding our own belief-formation processes against our tendency to seek confirmation and ignore the power of falsification.

One more case? Attendees of last week’s Conservative Political Action Conference (CPAC) simply refused to accept the fact that Trump’s vacation expenses cost taxpayers in the neighborhood of tenfold what Obama’s did, presumably in part due to the cognitive bias that privileges Trump’s narrative and *thus* interprets all other data points as errors.

* - The ‘thus’ is important: It signals that the commitment to the narrative precedes the gathering of evidence, and in effect filters it. Interpretation.

A handy video on how not to be fooled again: https://www.facebook.com/Channel4News/videos/10154548775681939/