Against The Anthropic Principle

By William M Briggs (wmbriggs.substack.com)

My friend (and friend of ours) Bob Kurland gave the presentation "Our Goldilocks Universe" at the Institute for Theological Encounter with Science and Technology on anthropic coincidences. These are my reactions to his speech. I gather the speeches will be online at some point. I'll post links here when they're available.

What's Hiding Behind Why?

Whatever is has to have a reason why it is the way it is. So it is with the world; or, if you want to sound more science-like, the universe. This is the principle of sufficient reason. Things cannot exist or be like they are for no reason. Things cannot exist or be like they are "randomly", because randomness isn't a cause, but a state of mind. Whatever comes into existence must have a cause. So we look for causes for the Way Things Are in science.

Could one of the causes of the world have guaranteed our existence? That is, were we meant to be here?

The weak anthropic principle is trivial enough. We see what we can see, and that we *can* see, is because things are the Way Things Are. If they had been different, we wouldn't be here to see.
Obviously, *that* we see is proof the Way Things Are are sufficient *for* us to see. So there is nothing in this principle; no insight gained from it. Which is its oldest criticism. It is a tautology.

The strong version, or a strong version, say that the Way Things Are had to be the way they are *so* that we can see. This is not only a larger claim, but a claim of an entirely different metaphysical sort. But it, by itself, is not convincing evidence that the Way Things Are *must* have been the way they are. Not for those who hold with materialism, by which I mean the philosophy that all things were created, and are managed, by entirely natural, and no supernatural, processes. If materialism is true, some say, the world could have turned out differently; thus, there is nothing special about this world, except that we happen to be in it. And we are nothing except the result of entirely natural processes.

This is satisfying for the materialist because he can write down equations, based on "laws" which he defines numerically, and which he claims guide the way the world works. If this is so, there are two choices. The "laws" themselves are fixed, or they are changeable.

If they are fixed, then there has to be some reason why the fixed "laws" are fixed the way they are. What is this reason? Or are there reasons, i.e. sets of reasons responsible for different groups of fixed "laws"? If there are reasons, and not just a single reason responsible for all fixed "laws", then there must be an explanation for why there exists this separation of powers, and what caused this separation, and why each reason is responsible for its fixed "laws" and not others.

But we can see that this won't do for a full explanation. There must be a supervening overarching law or authority responsible for creating the separation of powers, because everything has to have a reason for its existence, and that includes the separation. Something must have been caused the reasons which are responsible for the powers of creating the different groups of fixed "laws".

Or if there is just one set of fixed "laws", then again some one thing above these "laws" must be responsible for the "laws" taking the form they take, and giving them the powers they have. One can posit stronger "laws" ruling over the observable "laws" we see, in some kind of hierarchy, with some rules or rulers being hidden from us, but this must bottom out. It cannot go on forever. In the end, there must be one unchangeable cause responsible for the lot. This argument may now sound familiar. We'll come back to it.

One cannot just point to "laws" as if they came into existence by themselves, which is impossible. Something cannot come from nothing: nothing is no-thing. And no-thing is as strong a statement as you could wish. A non-thing has no powers of any kind, and no hint of any kind of existence; no, not even "fields", as some physicists say. A field is a thing and not a no-thing. And any thing must have a reason for its existence.

At any rate, if the "laws" are fixed and had to be they way they are, then we had to be here the way we are. For we are nothing but products of these "laws", which is a premise of materialism. Thus, if the "laws" are fixed, however they came about, then since we are here and the product of these "laws", as

everything is a product of them by premise, then materialism with fixed "laws" confirms a version of the strong anthropic principle. The Universe (so far undefined) created the "laws" and these inexorably led to us. We had to be here because the "laws" guaranteed this.

The other option is to claim observed "laws" could have been different; therefore, the world could have been different. Because the world didn't have to be this way, we didn't have to be here. Therefore there is nothing special about us or the world. There is in this view, to the materialist, no need to invoke any supernatural entities to explain anything.

This argument is a bluff.

When the materialist says the world, or its "laws", could have been different than the way they are, he is bluffing. He has no evidence this is so. It is mere assertion. For he never says, and never can say, where his "laws" come from, as we just saw, and why these "laws" are the Way They Are, and not something different.

He has made attempts, however, pointing to his equations. He says, again bluffing, "These equations could have been different". There is truth in that if he means his equations are incomplete or merely theoretical or are not fully descriptive of observation. But that points to incomplete knowledge on his part, and does not say that the world could have been different.

The person arguing for fluid or changeable "laws" does not mean it in an epistemological, but in an ontological, sense. Take the so-called constants of nature, parameters in models, like the "fine-structure constant", itself a function of simpler, more "basic" constants; i.e. electron charge, Plank's number, speed of light, the electric constant, and pi (yes, even pi has to have a reason its value is what it is). These, and certain other numbers, are necessary parts of the "laws" physicists have, as Bob pointed out with other similar examples. These numbers are not derived from simpler formula or known "laws", but are experimentally (phenomenologically) derived, and form the "dials" in theories so that theories fit observations better.

The variable-"laws" advocates says these constants could have taken different values. Advocates point to two main ways different constants or "laws" could have arise: various ideas of multiverses, and probability. But really these are the same (at least in spirit). Let's look at the many multiverses (a nice pun), and their use of probability, and see why these are no help to the materialists.

That's A Lot Of Universes

Max Tegmark speaks of "levels" of universes. These are universes which have different parameters, or different physical constants, or different starting values.

The first level of multiverse is the same as ours, run by the same physics, but each has different initial conditions from whatever conditions existed at the start of ours. That is, the other universes have the same "laws" and constants, but different starting points. How these initial conditions are chosen and why ours got the values it did is never specified—for the very good reason that nobody knows anything about how the initial conditions were caused, except by some hand-waving about quantum mechanics. Nobody hows how any quantum mechanic result is specified. We do not know what causes QM events,

so we cannot know why our universe had the initial conditions it did. Therefore it cannot be claimed it could have been different.

But we do know that everything has to have a reason for why it is the way it is. So that even in this set of repeated-laws-but-randomly-different universes, there has to be a reason why this one, and that one, and ours, have the values of the parameters or constants they have. That is the second level of multiverse: same laws, but different values of constants (and therefore also different initial conditions). Some Thing had to do the picking of either the initial conditions or constant values. Just as some thing has to be responsible for every QM event. That reason cannot be randomness. "Random" is not a power: it is not a force. It therefore cannot be the cause of anything. Random only describes our state of knowledge, which for QM events is incomplete.

One could allow the presence of a Conditions (or Initial Values) Picker, and say there is nothing special about the values of *our* constants; they were simply the ones picked by the Picker. But that leads to the question of what made the Picker pick its picks, and not others. Again, this could not be "randomness". Was this a conscious decision? The Picker could itself be in a chain of causes, but even this chain has to bottom out. There has to be a reason the chain was set in motion, at its base, and ended up the way it was, and with our constants taking the values they take.

The same is true for a Constants Picker who, or which, is responsible for creating other universes with different values of constants, or a Law Picker who, or which, is responsible for creating other universes with different laws (this is the third level of multiverse). No matter which of these scenarios is chosen, some Thing still has to pick the Pickers. I mean, something has to cause the Picker, or the Picker has to cause his choices.

Many worlds is another kind of multiverse. It purports to explain QM events by saying, in brief, that every time a wave function "collapses" it does so by creating an entirely new universe, each branching off the current one, where the new universes are exactly identical to the current one except that each new one takes every possible value in the QM event. Eventually, one of these branches produced us, by picking the universe with our constants and laws and so forth, and we went on branching from there.

Now it's easy to dismiss this as ridiculous, but that's not a completely satisfying proof against it. The real problem with Many Worlds, as I have pointed out many times, is that it does not solve the problem it purports to solve. It only moves the problem of causation one step backwards. In the collapse, there *must* be an Overseer that dictates this new universe gets this value, and that new universe gets that value, and no repeats or duplications, and so on for all the values that must be produced in a "collapse."

Which could be infinite. First consider an event can collapse to values A or B (spin up and down, say). Then the Overseer must ensure this new universe gets A, and that one B. If there is not an Overseer, both universes might, say, get B. Then take position events, which are, some say, infinitely valued. The Overseer here has to have infinite powers of creation and omniscience, to muscle all these new universes into creation in an instant, and to ensure every one has the one precise value needed, and that there are no duplicates.

Such an Overseer might exist. If so, it has direct contact with all universes in the infinite multiverse, which of course it oversees. Which means universe-to-universe contact is a real possibility, though only

with the Overseer's permission or assistance. The infinity is there not only because of position collapses, but because collapsing is going on all time, and for a long time, even if creating new universes. That makes the Overseer both omnipotent and omniscient, for there is no other way to juggling Infinity.

Lastly, some try to say that "probability distributions" tool around in the void and from these either "laws" or constants or initial conditions are picked. If that is so, then what caused the probability distributions? And what mechanism extracts "laws" or constants from them? As you can see, casting the problem in terms of probability is of no help.

Incidentally, this is why the universe cannot "have" a probability, nor can any "law", constant, or initial condition. Nothing "has" a probability. Probability is only a measure of information between sets of propositions, like logic. And relations are not causal.

One Through Five

All these criticisms sound, or should sound, familiar. They are all variants or extensions of arguments like St Thomas Aquinas's Five Ways to show the necessity for Ultimate Order in the world, and to name some of his properties (like omnipotence and omniscience).

As briefly as possible (and obviously incompletely), these are:

1. Change: If anything changes, there must be an unchanging Changer;
2. Cause: Any cause requires there to be a First Causer;
3. Gradation: If there are gradations, there must be an ultimate;
4. Necessary Being: all things depends on their existence on other things, but to keep it all spinning there must be one being whose existence is necessary;
5. Design: there must be a Picker and Lawgiver.

In short, in arguing why we see what we see, we are inexorably led to ask not just why things are the Way Things Are, but why there is anything at all and not no-thing. We always end, and must end, at the Ultimate End.

Of course, even if we accept these arguments, they do not show *why* the Uncaused Cause, the Picker of Pickers, The Lawgiver gifted us with the world as we see it. Scientists are not wrong in seeking how far they can go with What Caused What, in figuring out (with respect to the First) "secondary causes". It may be the "laws" they offer are it—real unchanging and unchangeable laws—and the constants that fit into these equations really are "hard-coded" into the fabric of the world.

But I think they might not be, and that science can benefit from greater insights granted from deeper contemplation of these kinds of arguments and a richer philosophy of nature than materialism or reductionism.

Law Against Laws

Take away either hydrogen or oxygen and you cannot have, or notice, water. Water would not be water without the essential properties it is, which are quite (if I may) miraculous, as Bob specifies. If we removed any of these essential properties, water would not be water, but it would be something else—or nothing at all. Of course, water is not mere hydrogen plus water, but something else entirely new, a

thing with essential properties unpredictable from knowing the essential properties of hydrogen and oxygen.

There has to be a reason why these properties exist, and not others. And why water has the powers it does, and not others. That recognition brings us back to the arguments above, which we need not repeat. What I want to emphasize is a different way to think about the anthropic principle.

Properties can be coincidences, as Bob suggests, as long as that is meant as the surprising presence of a power or essence where one wasn't expected or thought of. In other words, in an epistemological sense, not ontological. *Coincidence* itself has two meanings: (1) groups of events or incidents that are thought not to have a causal connection, e.g. "That's just a coincidence!", or (2) where the events or incidents are thought to have an underlying cause (in one of its four senses), e.g. "That's a strange coincidence." In both cases, the definition hinges on cause, or lack of it.

Just as water would not be water without its essential properties, and just as dogs wouldn't be dogs without legs, because having four legs is essential to having the form of a dog, our world would not be our world without its essential properties. And those properties cannot be coincidences in a causal sense.

That there are properties, essences, at all is what is key. Not "laws". That substances take on the forms they do, and have the *powers* they have, must have a reason, and that reason, as we saw, cannot ultimately be "laws", because this never explains where the "laws" come from themselves. And it's likely the "laws" can never tell us why essential properties must have the form they do. They certainly haven't explained why water is the way it is.

In other words, there might not be "laws" at all. I don't think there are, in the traditional sense.

Here I follow philosophers like Nancy Cartwright. Quoting from Cartwright's *How The Laws of Physics Lie*, she says "that the laws of physics do not provide true descriptions of reality", but only approximations; mere *ceteris paribus* generalizations. "Laws" are equations that describe theoretical causes that function as the "laws" say they do but *only if* all other things in the world are held—*constant* is not quite the right word. Held in abeyance is better. Which, of course, never happens in the world. Instead, substances are subject to all manner of powers, interior and exterior.

We must look instead, says Cartwright, not to theoretical instrumentalist laws, which are indeed terrific at aiding in making machines and making predictions about the world, but to phenomenological laws, which are descriptions of substances and their powers. Theser "are indeed true of the objects in reality", she says, which reminds us that "the fundamental laws are true only of objects in the model."

And we all remember our Modeling Mantra: All models only say what they're told to say. Therefore, we want our models to tell the truth. But while the "laws" of physicists might tell us some of the truth, they do not tell us truth, the whole truth, and nothing but the truth, so help them God.

The laws of physicists "describe the causal powers that bodies have," says Cartwright. That means the objects *themselves* act by the powers they possess, or they are acted on by other bodies with the powers they have, but *nothing* is being acted on *by* "laws". "Laws" are not forces: things, *substances*, have

causal powers. This is a top-down and not bottom-up reductionist philosophy. It is not atoms shaking in the void causing all we see, but substance using powers.

Which means, if science is to survive, it must take on a new, or rather old, philosophy of nature. That of substance, and not “laws”. But that is a story for another day.