

BECAUSE WE ARE HERE

Pangloss was professor of metaphysico-theologico-cosmologology.

Voltaire (1759)

We're here because we're here because we're here because we're here....

Soldiers' song (ca. 1916)

Nothing could be deduced, except that reality was improbable.

Georges Simenon (1931)

The Anthropic Principle ... can be paraphrased as 'Things are as they are because we are.'

Stephen Hawking (1980)

There is an old debate in philosophy about whether the world outside our minds exists at all.

Jay Kennedy (2003)

The anthropic principle has always struck me as so dumb that I can't understand why anyone takes it seriously.

John Horgan (2010)

Pangloss is the quintessential optimist charged with the education of Candide. Satirizing Leibniz, Voltaire makes him proclaim this to be 'this best of all possible worlds.' Physics seems to be on Pangloss's and on Leibniz's side.

Tomorrow's lesson plan's on deck outside the bar beside the pier. It's noisy on a hot night when it's open late, but handy for a snack. Heat haze simmers off the land and out to sea. Pangloss is on my mind; my mind meanders. What if Frank should actually crack this case? Inevitably the Beginning will breathe life into the question with the deepest philosophic roots, the question: *Why?* In particular, why should the universe, thus begun, whatever thus is, then give rise to life and even to a life form that can ask the question? Why should it be at all Panglossian?

Modern physics brings a new insistence to this issue. It says if the laws of physics were a little different the chemistry of DNA just wouldn't work. There would be no life on Earth. Indeed with only tiny changes to the laws of physics there would be no Earth. I have a stack of books about how fine-tuned physics' laws must be for us to be. None says why they are.

The *Anthropic Principle* is the name of an attempt to use *us* to explain. He

bumped into it already. It comes in several flavors. They posit many—even an infinity—of universes. Or—it would need a movie except Greene has done it—there is Tegmark’s *Multiverse*. In our universe or piece of it the laws of physics are fine-tuned. Proponents say that if they weren’t, we wouldn’t be here to take notice that they’re not. This last is true. But as an explanation for the universe it’s *ex post facto* reasoning. By this I mean: It’s fine to use the fine-tuned physics to explain the possibility of life; but life does not explain fine-tuning.

And physics the Anthropic Principle is not. It makes no testable predictions. This is not a failure of its fans to do their homework. It will *never* predict anything that they can test. In frustration Smolin proves this in a lengthy paper. I’m naive so it seems obvious to me.

It gets worse. The Anthropic Principle asks about the probability our universe (or our part of it) would have its physics in a narrow range. The study of such probabilities is called statistics. It’s not intuitive. Misled by misused probabilities, Disraeli warns, ‘There are three kinds of lies: lies, damned lies, and statistics.’ Done right, statistics draw on data. Statisticians need a sample of examples. Then they calculate the odds. But physicists are bookies who are looking at one horse and never have—and never will—set eyes upon another. They have info on one universe. What can be said of its parameters based on a sample size of one? It’s this: The probability that they will be what we do observe is one. Point zero. Statistics in this situation are a fancy dress-up for imagination.

The Anthropic Principle is well summed up by soldiers marching to their deaths in World War I: We’re here because we’re here.... It explains nothing. It is ugly.

So it’s shocking to see Hawking giving his endorsement to it in *The Grand Design*. That’s what Horgan’s on about. Not that Horgan thinks that Hawking’s dumb. Horgan thinks the whole thing’s Hawking’s sense of humor. Works for me.

As I walk the hundred paces back to my apartment it seems clear to me. I hope it will be clear to him. It’s here because we’re here may seem seductive but it’s not the way to be.

Physics and philosophy are full of contradictions. A fictional detective, if we had one—a good one such as Holmes or, better yet, Maigret—would be in his element. A real detective might descend into despair.

Tomorrow should be happy. The physics landscape—or my map of it—ends here. His time is nigh. He needs to wrestle with the clues—my list of stubborn problems. How it has grown! When we embarked two months ago in our small ship of fools I didn’t dream of finding such a shambles.

Lots of problems? is what I expect he’ll ask me in the morning, anxious from the pep talk he just read. No, I’ll reassure him. Lots of clues.

The idea is to pack the biggest punch into the smallest size and see what happens. The size is set by the projectile. Accelerator hot-shots favor protons. A proton is much smaller than the smallest atom. Huge magnets and a long run get them up to speed. At the collision point a single bunch of protons packs more impact than a high-speed train wreck. For an instant all the energy is matter. What kind of matter? That's what the experiments will answer.

He comes around the bend to ALICE. The instruments have signaled that it worked; the bottle holds a black hole. In his hand he has a replica that holds a small explosive charge. It's a calling card he leaves to show the threat is real.

Ounce for ounce, black hole is worth far more than any other kind of matter. He has maybe four micrograms. The contact's offering three billion times the price of platinum. Is he making a mistake to trust her? He tries to keep this thought in focus as he heads back with the bottle. It's not the risk of getting caught; it's all that pent-up energy that makes him tense.
