

## Complementarity: Quantum Physics and the End of Dogma

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I have been wrestling for several years with a simple question, and it really is simple, and it is one most of you have probably wrestled with, too. That question, and my asking it, is central to my work in science and spirituality, and yet I have been stymied by it. The question is: What are my religious beliefs?

My religious *communities* are several, and I like it that way. Each provides a different something to my experience of life, but all of them are big-tent communities and don't really answer the question. Being a UU for example gives me a place in a community of religious odd-balls, but we're all odd in different ways.

When someone asks me that dreadful question "Do you believe in God or not?" it simply doesn't work to answer "I'm a UU." It's a non-sequitur, a dodge. I might as well say "I'm a plumber." I'd like to have a word or phrase that means what I mean. What DO I mean? For me it hinges on ambiguity.

My friend Linda wrote to me, asking for help. She is not any kind of whacko, and is not especially gullible or flaky, so I was fascinated by her description of what happened. This is a long quote, so it's all her until I say "endquote." She writes:

I wonder if you could help me understand from a more scientific view something that I experienced.

I was walking the Camino de Santiago in Spain and I was wondering if at the next town we would meet up with my Grandson. As we were coming upon the town (an abandoned town high in the mountains and isolated)—now this is going to sound strange and I have never experienced anything like this--a shaft of energy came from above me and went through me. I hope you will stay with me. It is hard to describe but it was an energetic force like a big shaft of light from the sky without the light. I could definitely feel it. It didn't hurt and right afterwards I thought my grandson was there and he was.

It was hugely tangible. This "force". There was no denying it and I was very aware.

Have you ever heard of anything like this or could explain what this

could possibly be? I have had many spiritual explanations. It was so strange that I still wonder what it could be. Thanks for listening. Endquote.

Notice how tentative Linda is in describing this experience! She expects me to laugh at her. But she'd already had "spiritual explanations," apparently none satisfying.

Some of you are now doing what people usually do, which is jumping to conclusions that fit their pre-existing worldviews. Some of you might be thinking: "It was a hallucination; she was dehydrated or something." "It was a visit from angels." "It was a sign from God." "It was a portal to a higher dimension." "It was a mild stroke, or some other temporary neurological problem." "Maybe she was having an LSD flashback." And so on.

I say there is only one fully authentic answer I could give her. Here's what I wrote in reply, and this too is a long quote:

Linda, direct experience is all we *ever* have to work with! Each of us has to make sense of the world as we experience it, and sometimes we try to fit the experience into a worldview that doesn't allow the experience to be as it was. Don't let anyone detract from or alter your memory of this.

I have heard others speak of experiences like this. My suggestion (to myself as well) is to just let it be, just as it was. Any explanation, from anyone, can only diminish it.

I say take it on face value as a mysterious, uplifting experience that was Real and needs no explanation. Instead of trying to force it into a label, focus on how it felt and what the experience means for you right now, today.

I think when we take the numinous and ineffable and try to use language to describe it, what was an expansive experience gets filtered through our culture's narrow filters (whatever culture we're from), and that process necessarily corrupts it. Try to remember it without words.

Feel the sensations you felt then, and try to carry that wordlessness through the next few hours or days, and just see what happens.

If you want my thoughts on what it “really” was, the only honest answer is “I don’t know.” I believe you that it happened, that it was real and tangible for you, and I believe it’s important. I’ve just learned that too much thinking can ruin experiences like this. End quote.

People familiar with my work know that science is bedrock for me. I try not to believe in stuff that there’s no evidence for. Even then, when there’s a *lot* of evidence for something, I try to take it on as a contingent belief, not a certainty. The stronger the evidence, the more confident I am, but I try to remember that new evidence could come along and shake everything up.

Some might say “But that means you don’t actually believe in anything!” Well, if “belief” means unshakeable faith *immune* to new evidence, then yes, there is nothing I “believe” in. All knowledge is conditional. All certainties are chutzpah. To believe in something unshakably, completely untethered from experience or evidence, is to disconnect oneself from reality, from evolution, from the flow of life.

Conditional belief is like a boxer’s stance, or a tai chi movement - always flexible and responsive, never settled or seated in a position. This is the essence of science. It’s also pretty unusual for humans to actually live that way. I am still pretty much an apprentice of it. We humans really like to *know*, or at least *pretend* we know.

Another of my religious communities is the Religious Naturalist Association. We define ourselves like this: (quote) “Religious Naturalists take nature to heart. We hold a naturalist view of how things are in the world, and we also see ourselves as religious, in non-traditional ways, as we absorb the wonder of being alive and the order and beauty of the cosmos. We ask “What is?” and “What matters?” seeking answers from natural (rather than supernatural) sources.” (end quote) In short, most Religious Naturalists are atheists, including me, sort of. In my discussions with others in that community I am sometimes frustrated by a dogmatic adherence to materialism that I think is too quick to dismiss personal experience that’s ambiguous or hard to explain, like Linda’s. Like my own.

For example, I am and have long been personal friends with the grandson and great-grand-daughter of Edgar Cayce, the famous psychic. I met Edgar Cayce’s son Hugh Lynn Cayce when I was a young man working at a summer camp run by the Edgar Cayce Foundation. The Foundation was organized in 1931 to research and explore ideas found in Edgar Cayce’s psychic readings. Ideas like reincarnation, pyramids, astrology, Atlantis, dream interpretation, a lot about diet

and health.

If you're a science-minded skeptic like me, you may already be doing the eye-roll and surreptitiously searching for an exit. I get it. Edgar Cayce's psychic powers were thoroughly debunked when he was still alive in the 1920s. By debunked I mean that skeptics demonstrated that a clever shyster, with knowledge of stage magic and enough rudimentary medical vocabulary, could do everything Cayce did without any help from supernatural sources. If not for my personal knowledge of the Cayce family, that would be enough for me. I would conclude "nothing to see here" and move on.

But I know those people, well. They are not hoaxers. They are good, kind, honest, sincere people. So on the one hand, my science orientation puts me squarely in community with skeptics who dismiss all this as fraud at best, and dangerous pseudo-science at worst. On the other hand, I know these people. They've dedicated their lives to sharing Cayce's life and work, and they're certainly not getting rich from it.

To be clear, I do NOT expect anyone to believe in Atlantis or reincarnation based on my assertion that Cayce's descendants are sincere people. I don't, myself. So. What do I believe? That Edgar Cayce tapped into some supernatural library of eternal truth? Or do I side with the skeptics, sure that it's all so much hokum and naiveté? Though it may seem irrational and contradictory, I choose both. and neither. I choose *both* .. both and neither. Here's why:

I don't believe for a minute that every aspect of the natural world has been discovered by science, or even that all the relevant *categories* of force and energy have been discovered. Could there be some natural channel by which Edgar Cayce could learn or know things he had no obvious way to know?

My most thoughtful Atheist friends would say "Possibly, but my bet is on No." Less thoughtful ones would indignantly retort "Poppycock!", even though it was a yes/no question! My own answer is: **I don't know**, and beyond that, I *know* I don't know, because I *can't* know. This is key to my message this morning.

Less than 100 years ago, Werner Heisenberg showed us that because of an inherent ambiguity in the nature of subatomic particles, we can never know both their position and momentum with any precision. No, that's not quite right. It's not that we can never *know* both the momentum and position of a particle, it's that the particle *doesn't have* both a precise position and momentum. The two quantities are mutually exclusive.

When a particle's speed is measured precisely, its location in space smears out to fill the entire universe. When you nail it down to a precise location, its momentum becomes a superposition—a stack—of an infinite set of values. It becomes an infinite *group* of numbers rather than a single value.

Confusing, right? This bizarre bit of knowledge came about in response to the question, “Are subatomic particles objects or waves?” Well, even though the two concepts are mutually exclusive—as in, they can't possibly be both—they are indeed both, but can only express qualities of one or the other at any given time.

The position and momentum of quantum particles are known as complementary variables, because you can know one or the other but not both. You can treat particles as objects or waves, but not both. They ARE both, somehow, but the two models are incompatible. This condition is called *complementarity*.

That term “complementarity” is relevant to my quest for a religious descriptor. Coined by Neils Bohr, the father of quantum physics, complementarity is defined by ambiguity and paradox, by incompatible opposites that are both simultaneously true.

This idea that two opposing, conflicting, mutually exclusive ideas can both be simultaneously true has some weird implications. For example, you may have heard of Schrödinger's cat. Schrödinger was trying to illustrate how ridiculous the probabilistic nature of quantum theory was, and his parody of it became an enduring scientific quandary.

He described a sealed box in which a random quantum event, such as a uranium atom emitting radiation, would trigger the poisoning of a cat. After a while, during which the atom has a 50% chance of emitting the radiation, the cat would be simultaneously alive and dead, because the atom both emits and *doesn't* emit the radiation until it's observed.

It exists in a superposition of both states, emitted and not emitted, taking the cat along with it. Opening the box triggers quantum collapse, and the cat would *at that point only* instantly become either alive or dead. Until someone opens the box, the cat is thought to be simultaneously both alive and dead. This is complementarity.

We westerners are *either/or* people. All of our logical reasoning is founded on the notion that if A and B are incompatible, then either A is true or B is true, (or neither). If A is true, then B must be false. And all that beautiful *either/or* logic has served us very well, because it has brought us to discover that we actually live in

a *both/and* universe. The words “wave” and “particle” are *either/or* names for *both/and* phenomena.

*Both/and* includes and surrounds *either/or*. (repeat) Just like the word “people” includes and transcends the words “friends” and “enemies.” This is a *both/and* universe with some *either/or* neighborhoods.

It’s uncomfortable not knowing what subatomic particles ACTUALLY are, or whether it’s a cat or a corpse. We like certainty. It’s why so many of us are so uncomfortable about androgyny and they/them/theirs as singular pronouns. We want to put our knowledge in boxes. We don’t enjoy having to make whole new boxes, like for the singular ‘they,’ but we can do it.

Complementarity is knowledge that will never fit in any imaginable box. Accepting that would require serious personal discipline, discipleship, contemplative practice. Complementarity evokes other concepts like paradox, crazy, strange, impossible, mystery. It seems we may now have strayed into the territory of mysticism. Fine with me.

In an interview with Krista Tippett, Nobel physicist Frank Wilczek said this about complementarity and the nature of quantum particles: (quote) “Sometimes it’s useful to think of it one way. Sometimes it’s useful to think of it another way. And both can be informative in different circumstances. But it’s very difficult, in fact, impossible, to apply them both at once...”

He goes on:

That’s the essence of complementarity. You have to view the world in different ways to do it justice, and the different ways can each be very rich, can each be internally consistent, can each have its own language and rules, but they may be mutually incompatible, and to do full justice to reality, you have to take all of them into account.” (endquote). That sounds like Unitarian Universalism, doesn’t it?

Another Frank, Frank Schaeffer, in his book “Why I am an Atheist Who Believes in God” writes:

“With the acceptance of paradox came a new and blessed *uncertainty* that began to heal the mental illness called certainty...” (endquote) It may help to know that Schaeffer is the son of famous Christian televangelists. He goes on: “These days I hold two ideas about God *simultaneously*: he, she or it *exists* and he she or it *doesn’t exist*. I don’t seesaw between these opposites; I embrace them.” Sound familiar? In physics terms, Schaeffer holds these two complementarities in superposition, like waves and particles, applying one or the other as needed to live a fruitful life, but not trying to force his reality into one box or another. I aspire to the same.

For a while I called myself an agnostic, but “agnostic” literally means “not knowing,” and for me that just felt a little too indecisive. I am not agnostic about whether atoms or light are made of particles or waves; I *know*. I know that they are paradoxically both both and neither, and that everything in my life and much of the universe is made of this same odd stuff. Even here, it’s not an unshakeable certainty, but clear enough to base a worldview on, as certain as the round earth and the kinship of life. Let’s call it “quite certain.”

Similarly, I am quite certain that there are fundamental aspects of nature yet to be revealed by scientific investigation. It is possible, though not likely, that some of those aspects may allow for phenomena we would regard as supernatural or paranormal today. I am *not* agnostic, because I DO know; I *know* that I *don’t know*, and that other people’s experiences are different from mine, complex, ambiguous, hard to explain. Joseph Campbell says “He who thinks he knows, doesn’t know. He who knows that he doesn’t know, knows.” I’m happy to accept Joseph Campbell’s seal of approval!

Like Schaeffer, I am an Atheist who prays. I do not believe that an intervening supernatural deity will hear my prayer and violate the laws of nature to my benefit, but I can’t rule it out. But no, I pray because **I** hear it, and it affirms my highest values. Does prayer work? If you’re praying for a new Mercedes-Benz, I’m quite certain it does NOT. But as a vehicle for reaching into my own subconscious and steering it towards my highest ideals, well, it works for me. God, grant me the serenity to embrace the ambiguities I cannot resolve.

Asking, “So do you believe in God or not?” is like asking what color the yin/yang symbol is. It’s not actually a binary question, though it’s often posed as one. Answering it honestly requires nuance, for me at least, but also even for the dogmatic extremes. Which God? With what powers? By what standards?

I am a complementarist. (Be careful not to confuse me with complementarians; that term refers to religiously-defined gender roles, where men are the rightful heads of their households, because...bible.) I thought I had invented the term complementarism from complementarity, but in preparing this sermon I googled it just to see, and found the following on a page at Rutgers: “Complementarism is the philosophical framework constructed on the basis of the postulate that the principle of complementarity formulated by Niels Bohr in quantum physics can be applied to biology, philosophy, and religion.” That’s the actual description of an actual course, titled “Complementarism: A Science-Based Philosophical Framework for Integrating Irreconcilable Opposites.” I have a tribe!

As the basis for a worldview, Complementarity offers guidance for many social issues. If an electron can be both a particle and wave, a child can be both male and female. An immigrant can be both an American citizen and speak their first language. A biracial child can be both white and Black, and not have to explain herself to anyone. And I can be both an atheist and deeply religious. I think this approach offers a kind of deep humility that is sorely lacking in society and politics as a whole, especially, these last few months, in eastern Europe.

I am a complementarist. My theology is embracing the paradox of irreconcilable opposites that are nevertheless both true, or at least both helpful. I am an Atheist who prays, a new-Age skeptic who is more interested in your experience than my explanation of it. My god is nature's nuance, and my spiritual practice is to live fully embracing that, starting with my perplexing fellow humans.

Go ahead; ask me if I believe in God! I'll probably remind you that Creation itself is deeply ambiguous. I might say: "Tell me about the most puzzling and mysterious aspects of your beliefs - where do they contradict themselves? Where do they defy explanation? Because that is the happy crossroad where your path and mine join.

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