

The Paradigm Discourses

“Firm Color”

Truth is not relative, it's black or white, either so or not so.

– *Logic*

Reason was at it again. In a different life he might have been a magician. This week he had brought a strange box. On one side was a lever that could be placed in two positions; one said **touch** the other said **view**. In the touch position, the top was opaque while the front opened to reveal a soft seal that allowed one to reach through into the box to feel what was inside, but kept the object hidden from sight. In the view position, the top of the box was no longer opaque, one could see the object inside, but the soft seal was now closed off and inaccessible.

The box allowed one to either feel the inside object or see it; but not both at the same time.

Curiosity, “Reason, darlin’, do you have a name for this charming box of yours?”

Reason, “Hmmm, I’ve a few thoughts about what to call it, but none seem to fully capture its nature. Frankly, I’m uncertain what its name should be.”

Logic joined the group, carrying a plate of half eaten hors d'oeuvres, “I’d like a demo as well.”

Reason obliged. “Here, set the lever to *view*, then look. What do you see?”

Logic peered into the top of the box, “I see a white object.”

“Good, now look again.”

“Still white.” Logic took another bite.

Reason moved the lever to *touch*, “Ok, now reach into the box through the front. What do you feel?”

Logic reached inside, and after getting a firm grip uttered, “Whatever it is, it’s hard.” Without being prompted, he removed his hand, and promptly reduced the amount of food on his plate again.

Reason, “Do you believe that if you reach inside, the object will still be hard?”

“Of course, how could it be otherwise?”

Reason, pressing the point, “So you’ve concluded that the object is both white and hard?”

Logic looked at Reason, paused, then, “Ok, now you’ve got me suspicious. This is another one of Paradigm’s primrose paths isn’t it? That’s ok, I’ll play along.”

“Good.” Now change the lever back to *view*, “Take a look at the object.”

Logic looked, then did a double take, “Hey, now its black!”

“And if you keep looking...?” Reason raised an eyebrow.

Logic looked into the box, then away, then back into the box, and away again, and repeated this strange behavior several more times. “Always black,” he uttered a little flustered, “so now what? Wait, I can see what’s coming. Time to touch it again.” He put down his plate, not quite empty, and switched the lever to *touch*, then reached inside. Looking at Reason, “Now its soft! Mathematics get over here, I’m going to need you.”

For the next 15 minutes Logic played with the box while Mathematics kept a careful record of Logic’s observations. Logic would look for a while, then touch for a while, back and forth,

sometimes just one observation between switching the lever, but often a half dozen or more. Everyone else just sat back and watched, enjoying the spectacle. They were content to let Logic and Mathematics do the heavy lifting. They were not disappointed. The pattern was soon obvious, even without Mathematics' formal analysis.

Whenever the lever was changed, the object inside could not seem to remember what it had been before. On a change to *view*, it had a 50/50 chance of being either white or black, and on a change to *touch*, it had a 50/50 chance of being either soft or hard. But in between switching the lever, it never changed from what it last was. View randomized firmness – touch randomized color. Proof summed it up, “Very weird, very counter-intuitive, delightfully unpredictable and completely inexplicable.”

Reason preened, “I’ve captured a quantum object,” he declared, “and trapped it in this box.”

Curiosity, enjoying the unpredictable behavior at least as much as anyone else, “How do you explain this strange behavior?”

Dogma, intruding, “There is no explanation. Mathematics analyzed the pattern and reduced it to a simple rule. The rule is all you need to know to predict the behavior. True, the rule is probabilistic; when the lever is switched, the outcome is random, but it’s a quantum object; asking for an explanation is not rational.”

At this, Paradigm balked, “Disagree. Let me point out that the whole purpose in Understanding assembling this group is so we can in fact come up with sensible explanations for the why of things. I’m not content with just knowing the what.”

Experiment, anticipating his own witticism, “Well, that’s because you’re an *idea-list*. I’m perfectly ok with prediction.”

Theory, disagreeing with Experiment, most likely simply on principle, “I’m well aware of your propensity to shout, ‘shut up and compute’ but I’m with Paradigm on this one. Besides I think I have an idea of what the why is.”

All eyes locked on him. Theory continued, “Here’s a novel idea; the very definition of hard is half white and half black, and the definition of soft is half black and half white. Note that the order of the *halfness* is relevant; half white/half black is hard while half black/half white is soft. By symmetry, the definition of white is half hard and half soft, and the definition of black is half soft and half hard. Again, notice a difference in the order of the *halfness*.”

Dogma rolled his eyes, “Firmness and color are different things, you can’t convert one into the other.”

Paradigm, “So were space and time.”

Curiosity, “How do we know they are not aspects of the same thing?”

Dogma, “Because they are not, we define them differently, we measure them differently, they have different units; therefore, they are different things. QED.”

Paradigm shook his head, “No, that’s a false distinction. I think Theory is onto something. When the object is hard or soft, it is in a *superposition* of being black or white. When the object is black or white, it is in a *superposition* of being hard or soft. It’s a kind of super-position, just not over position.” He looked at Mathematics, “Back me up here. Theory’s observation that the

ordering of the half color or half firmness is relevant can be captured via an even or odd phase relation between them, correct?"

Mathematics, "Yep, there are only two possibilities in each case, two orders, two invertible phases. They can be put into a one-to-one correspondence, so yes, I'd say they're equivalent and furthermore that phase is the stronger formalism."

Glaring at Paradigm, "You and your phase concept," Dogma spoke derisively, "I think sometimes you only like that word because it begins with 'p'."

Paradigm smiled, "Could be, I like paradox and puns just as much."

Understanding stood, the very act commanding attention, "A pun is a kind of epiphany; the brain measuring a meme. It's the unexpected realization that one thing can be viewed in two different and incompatible ways...interesting."